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Liability of design professionals for the preparation of cost estimates.

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LIABILITY OF DESIGN PROFESSIONALS FOR THE PREPARATION OF COST ESTIMATES

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ABSTRACT

This thesis presents factors relevant to determining a design professional's liability for inaccurate cost estimates. A study of the literature of/related to different types of estimating methods was performed to determine what other authors have stated the accuracy to be for the respective type of estimate. Standard form contract documents of the American Institute of Architects and Engineers Joint Contract Document Committee were compared to determine the design professional's duties in meeting the requirements of the contract. Appellate court cases dealing with disputes involving inaccurate cost estimates were identified and evaluated to determine the key and consistent issues and rules applied by the courts.

The cases are arranged by the primary interpretation rule which was instrumental in determining the outcome. The objective is to develop a flow diagram that owners and design professionals can use as an interpretive guide to assist them in understanding their requirements and liabilities for cost estimates. By formulating this basis of understanding of requirements, the parties will be able to practice claims prevention and avoid costly litigation.

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CHAPTER 1

INTRODUCTION TO COST ESTIMATE DISPUTES

For which of you, intending to build a tower, sitteth not down first, and counteth the cost, whether he have sufficient to finish it? Luke 14:28

Cost estimates are of concern to both owners and design professionals. The owner must be able to determine the amount of funds required for a project. Many times, the owner will provide the design professional with the requirements for a project and use the preliminary estimate submitted by the design professional as the basis for financing. In doing this, the owner may not understand that when a design professional submits an estimate, unless otherwise stated, it is just an estimate, not a firm cost or a guarantee. Therein lies the initial confusion and misunderstanding. On the other hand, a design professional is faced with the task of preparing cost estimates throughout various phases of the project with changing requirements, changing economic factors, and varying degrees of information. Even so, the design professional is being paid for a service, and is held to a standard of someone who can make a reasonable estimate to the cost of a project based on knowledge about the construction industry. The extent of a design professional's liability to an owner for inaccurate cost estimates is an issue which professional organizations have tried to minimize. However, the inclusion of exculpatory contract language may not protect the design professional who haphazardly or negligently performs duties regarding cost estimates.

BACKGROUND

Professional organizations such as The Engineers Joint Contracts Document Committee (EJCDC, 1984) and The American Institute of Architects (AIA, 1987) have

attempted to limit the design professional's liability for inaccurate cost estimates by placing exculpatory language in their standard contracts. Sweet states that "the length and complexity of the contract language demonstrates the seriousness of the problem" (Sweet, 1994, p. 192). For example, AIA Document B141, paragraph 5.2.1 titled "Responsibility for Construction Cost" states:

> Evaluations of the Owner's Project budget, preliminary estimates of Construction Cost and detailed estimates of Construction Cost, if any, prepared by the Architect, represent the Architect's best judgment as a design professional familiar with the construction industry. It is recognized, however, that neither the Architect nor the Owner has control over the cost of labor, materials or equipment, over the Contractor's methods of determining bid prices, or over competitive bidding, market or negotiating conditions. Accordingly, the Architect cannot and does not warrant or represent that bids or negotiated prices will not vary from the Owner's Project budget or from any estimate of Construction Cost or evaluation prepared or agreed by the architect. (AIA, 1987)

Even with this seemingly unambiguous language, the design professional may not be completely free from liability. In the case of **Malo v. Gilman**, 379 N.E.2d 554 (1978), the Court of Appeals of Indiana found that the architect, Malo, could not recover fees for a project where the bids were greater than 50% of the preliminary estimate. Contrary to this opinion, in the case of **Griswold and Rauma, Architects, Inc. v. Aesculapius Corp.**, 221 N.W.2d 556 (1974), the court found that the design professional could recover fees for a project where the low bid (after negotiations) exceeded the agreed cost estimate by 13%.

The percentage of the bid cost versus the estimated cost however is just one of the factors considered by the courts. The courts also review the actions of the parties during performance of the contract, whether the owner caused the difference in cost by making changes to the project scope, maximum price restrictions (express or implied), and the method in which the design professional prepared the cost estimate. In the case of **Williams Engineering, Inc. v. Goodyear, Inc**., 496 So.2d 1012 (1986), the design professional was found liable for damages "by failing to employ a professional estimator,

not examining other similar projects (the project was to design a water slide), not advising the owners about other contractual arrangements, and not providing revised cost estimates." 496 So.2d 1012 (1986)

From the owner's perspective, the meaning of the terms and contract language may cause confusion. For example in AIA Document B141, the contract requires the architect to provide cost estimates at various phases of the contract under the basic responsibilities, but also states that a "detailed cost estimate" is an additional service. An owner may be confused about why he should pay an additional fee for a "detailed cost estimate" when the estimate in his opinion was part of the original agreement. Sweet describes two models used by design professionals to prepare cost estimates; a traditional model where projected areas are applied to rules of thumb based on the design professional's experience (example, cost/square foot of building), and a "fine tuned" model where the estimate is based on much more detail (Sweet, 1994, p.193). An owner may not understand what information is required, the methodology used by design professionals in preparing cost estimates, or the difference between a cost estimate and a "detailed cost estimate". Furthermore, design professionals view cost estimates as an educated guess whereas an inexperienced owner may perceive a cost estimate as a fact to be relied upon (Sweet, 1994, p.194).

If the cost estimate proves to be inaccurate at bid opening, it may mean revising the scope, re-solicitation, or even cancellation of the project. This can cause damage to an owner who relies on the cost estimate to support timely project delivery. An owner may question why he or she should have to pay the design professional fee when in the owner's opinion, the design professional did not perform one of their duties satisfactorily.

PROBLEM STATEMENT

It is not clear how courts decide cases involving inaccurate cost estimates. What are the theories of recovery from which owners and design professionals bring suit? What is the magnitude of error between the estimated cost and the low bid which the courts apply to decide if the design professional can be held liable? How do the courts view maximum price conditions? What actions by the owner would cause the courts to rule in favor of the design professional? These questions will be researched to develop better understanding.

OBJECTIVE

This research will define the conditions under which a design professional can be held liable to an owner for inaccurate cost estimates. In making this determination, the methodologies used in preparing cost estimates will be described with respect to standard contracts published by the Engineers Joint Contracts Document Committee (EJCDC), the American Institute of Architects (AIA), and the Naval Facilities Engineering Command (NAVFAC). The research will include an examination of the requirements for submitting cost estimates during each phase of the contract. The research will examine how courts have viewed the difference between the cost estimate and bid costs and will determine the general percentage that would constitute liability for the design professional under ordinary circumstances. Other factors and special circumstances that have proven relevant in court decisions will also be examined, such as scope changes, economic factors, information available, maximum price restrictions, and timing, that might affect the liability determination. By identifying the relevant facts, a decision diagram will be developed to be used as a guide to owners and design professionals in understanding the requirements regarding cost estimates, and how appellate courts have applied the law in similar situations.

VALUE OF THE WORK

The Navy Civil Engineer Corps finances graduate education under the Graduate Education Program. A requirement of this research is that the topic must be applicable to construction engineering and management problems found in the Navy facilities business. The Navy Facilities Engineering Command (NAVFAC) awards a large number of design professional contracts each year. NAVFAC, which functions in capacities as both owner and design professional, will benefit from this research by gaining a better understanding of how the courts have viewed the relevant factors and applied rules in determining design professional liability regarding cost estimates. In addition, the results may reveal where changes need to be made to the contracts between the Navy and design professionals. This research is beneficial to both the Navy, and civilian owners and design professionals.

TASKS

To complete the research, the following tasks were completed:

1. Identify the standard methods used in industry in the preparation of cost estimates based on the requirements of standard documents published by AIA, EJCDC, and NAVFAC.

2. Conduct a legal literature review and collect appellate court cases that relate to cost estimates.

3. Analyze the court cases to identify factors that are relevant and how the law has been applied to these facts.

4. Develop a flow diagram to be used as an interpretive guide for owners and design professionals to assist in understanding the importance of cost estimates and how the courts have treated similar situations.

5. Evaluate the accuracy of the flow diagram by testing selected sample cases.

METHODOLOGY

The following approach was taken:

1. *Identify the standard methods used in industry for the preparation of cost estimates based on the requirements of standard documents published by AIA, EJCDC, and NAVFAC.* The contract language of the standard documents published by AIA, EJCDC, and NAVFAC was reviewed and compared with respect to requirements of each document. A literature search was conducted to establish the methods design professionals use to meet these contract requirements. Industry methods for preparing and adjusting the cost estimates for the different phases (Schematic Design Phase, Design Development Phase, Construction Documents Phase, Bidding Negotiation Phase and Construction Phase) of AIA Document B141 were evaluated. The industry methods of estimating were evaluated to determine the difference between the cost estimates provided by the design professional in the Basic Services and the "detailed cost estimate" provided by the Additional Services in AIA Document B141.

2. *Conduct a literature review and collect appellate court cases that relate to cost predictions.* A literature search was conducted using the LIAS system in The Pennsylvania State University library. In locating relevant court cases, the West Reporter System was used to include West's Descriptive Word Method, Topic Method, and Table of Cases Method. The American Law Reports, West's Corpus Juris Secundum, Shepard's

System, NAVFAC Office of Counsel, and the *LEXIS* system were also used. It is worthwhile to note that access to large electronic legal database services such as *LEXIS* and *WESTLAW* have made legal research a much more efficient operation. Another tool which could have been used extensively in conducting a literature review and gaining information (not used due to late discovery by the author) is use of the internet. As it turned out, a simple statement in the form of electronic mail stating the research being conducted, and an inquiry for information sent to an easily obtained distribution list of interested parties yields names of authors, publications, academics, etc. that have knowledge of the subject.

3. *Analyze the court cases to identify factors that are relevant and how the law has been applied to the facts.* Once the literature and court cases were collected, each case was evaluated by identifying the rules that were used by the courts in deciding the case. The cases were then reviewed as a group to identify rules that are common among the decisions.

4. *Develop a series of rules or questions to be used as an interpretive guide for owners and design professionals to assist in understanding the importance of cost estimates and how the courts have treated similar situations.* Once the common relevant factors were identified, a flowchart was developed that owners and design professionals can use as an interpretive guide to assist them in understanding their requirements and liabilities for cost estimates.

5. *Evaluate the accuracy of the flow diagram by testing selected sample cases.* The diagram was tested by interpreting selected cases that were not yet analyzed, and obtaining the same interpretation as the courts. The diagram was developed to help owners and design professionals understand their liabilities and responsibilities that are applicable in most situations.

ORGANIZATION

This thesis is divided into six chapters. **Chapter 2** defines various types of estimates, accuracy of these estimates, and compares the estimating requirements of standard contracts. **Chapter 3** defines the legal theories that are used in bringing suit for cases involving cost estimates. **Chapter 4** identifies the primary rules that are used in intepretation of cases involving inaccurate cost estimates, examines the rule "actions of the parties", and identifies the estimate percent error that constitutes gross negligence in contracts that contain a cost limit. **Chapter 5** identifies cases that were decided using the rule "read the contract as a whole", and provides a decision diagram for interpreting cases involving cost estimates. **Chapter 6** contains the thesis summary and conclusions.

CHAPTER 2

TYPES OF COST ESTIMATES

Cost estimating is a general term given to estimates of many types, methods, which vary in accuracy. Among authors of cost estimating texts, there are inconsistencies in the terminology used to define cost estimates. For example, one author might describe a conceptual estimate as conceptual, order of magnitude, cost per unit area or capacity. Another author might characterize this type of estimate as a screening or budget estimate. Although the terminology is not always consistent, there is consistency in the information used in preparing each type of estimate. In describing the information that is used for different types of estimates, definitions are helpful. The definitions provided are compilations from several published sources on cost estimating. The terminology used for each type of estimate seems to be most common among the various sources cited.

ESTIMATING TERMINOLOGY AND CONCEPTS

Cost Estimating - the process of predicting the cost of a project using available information.

Top-down estimate - approach to estimating cost that is based on an owner or design professional using a cost per unit or order or magnitude method based on requirements and information provided. Approach can become increasingly accurate as design decisions are finalized however no detailed quantity take-offs are taken or actual quotes from subcontractors received. Typically, preliminary estimates use the "top-down" method (Stewart, 1995, p. 671).

Bottom-up estimate - also known as detailed or "grass roots" estimate. Developed by performing a detailed, in-depth analysis of material prices, labor and equipment rates, quantities, overhead, and profit, and by collecting quotes from various sub-contractors that will be performing work (Stewart, 1995, p. 677).

Feasibility estimate - a "top down" estimate performed in the planning/evaluation phase (Clark, 1997, p. 27) for the purpose of the owner to determine whether or not the project should be built. Construction is only one part which includes such things as land, design, tax depreciation, investment tax credit, capital gains, annual maintenance and repairs, financing, and return on investment; A preliminary estimate is "sometimes based on functional requirements such as cost per pupil, cost per parking space, cost per bed, cost per kilowatt hour, etc.. Estimated cost can be measured by indices such as Time Referenced Cost Indices and Cost-Capacity Factors (Barrie and Paulson, 1992, p 201). It is also referred to as a screening, or planning estimate. Information used for the estimate might be size, capacity, location, and description.

Budget Estimate - performed during the preliminary design after the owner has completed planning work, screened options, and is in a position to seek management approval to proceed in developing the project (Clark, 1997, p. 31).

Conceptual estimate - a "top-down" estimate also known as an order of magnitude, ballpark, cost per unit area or capacity, systems, or comparison estimate. A conceptual estimate can be based on functional requirements as described in "Feasibility estimate" above, but more often described by using parameters, systems, square foot, or cubic foot costs taken from sketch drawings, outline specifications and other information available (Sinclair, 1989, p.3). This type of preliminary estimate seems to be what is contemplated in the Schematic Design Phase of AIA Document B141. Conceptual estimates are used as a factor to aid in evaluating various conceptual design solutions (Sinclair, 1989, p 3)

Design Development Estimate - a "top-down" preliminary estimate based on detailed working drawings which aids in confirming that the proposed design is still within budget. This estimate is more refined than a conceptual estimate but not as refined as a definitive or detailed cost estimate. More information is available for preparation, such as quantities of material and required labor, using unit prices. Although the flexibility is reduced, the design team can still make changes if the owner revises the budget (Sinclair, 1989, p. 4).

Preliminary Estimate - a "top-down" estimate that is ordinarily prepared during the various phases of design of a project. The estimate becomes increasingly accurate as decisions are made regarding design, and increasing levels of information become available from drawings, specifications, market conditions, etc.

Parametric Cost Estimating - also known as statistical, "top-down" estimating, formula estimating, or systems estimating (Stewart, 1995, p.705). Cost is measured for the entire job using certain major or physical characteristics, or "parameters", with the relationship to cost as developed by studies of past jobs and characteristics (Stewart, 1995, p.706). A technique that employs one or more estimating relationships for measurement of costs based on technical, physical, or other characteristics. An example of an overall parameter for a warehouse might be "gross enclosed floor area" (Barrie and Paulson, 1992, p. 208).

Definitive Cost Estimate - sometimes called an engineer's estimate. This estimate is based on detailed working drawings and specifications, and is sometimes used to provide the owner with an accurate forecast of actual cost with respect to the budget (Barrie and Paulson, 1992, p. 212). A definitive estimate is a prefinal estimate developed just prior to the production of final drawings and specifications. This type of estimate would typically be provided as the last refinement prior to bid opening. Although refined, a definitive estimate still encompasses a "top-down" approach based on parameters (ex. $/lf of wall).

Detailed Cost Estimate - sometimes called bid estimate (Sinclair, 1989, p. 5). A "bottom - up" method of cost estimating characterized by a thorough, in-depth analysis of all tasks, components, processes, and assemblies (Stewart, 1995, p. 677). This method encompasses a quantity take-off whereby the material, detailed labor hours, and equipment usage are identified, and separated by division and specification section. Detailed estimates can be separated into two categories: fair cost estimates (prepared by design professionals) and contractor's bid estimates. The difference is the design professional's estimate may not include lump-sum subcontract quotations, and may contain a simplified number of line items (ex. the contractor might separate overhead, profit and contingency) (Barrie and Paulson, 1992, p. 211). AIA Document B141 lists the provision of a detailed cost estimate as an "Optional Additional Service."

ACCURACY

A study of estimating accuracy from several publications, listed by author and type of estimate, in order of increasing accuracy, is shown in Table A-1. A review of Table A-1 shows there are consistencies in the literature regarding the accuracy of different types of estimates. From the data in Table A-1, a range of accuracy can be shown for each estimate type, Table A-2. In general, an early feasibility or screening estimate should be 40 percent accurate. As more information becomes available, the conceptual or order of magnitude estimate is developed which should be 15 to 35 percent accurate. The degree of accuracy of the detailed estimate is most consistent among the literature with a range of accuracy below 10 percent.

Figure 1 shows graphically the increase in accuracy for each successive type of estimate. The level of accuracy shown for a detailed estimate is quite small, however, it should be noted that it is generally recognized that significant effort is required to obtain only a few percentage points of accuracy when going from a definitive estimate to a

detailed cost estimate. For example, Atlantic Division Naval Facilities Engineering Command requires detailed cost estimates be provided with each submittal for contracts with design professionals. Realizing that each situation is different, it may or may not be beneficial to an owner such as the U.S. Navy, to pay the large amount of additional cost for only a small gain in the degree of accuracy. Perhaps the requirement by the Navy for detailed cost estimates is due to the need for strict compliance with acquisition regulations, the long budgeting process and fear of "busting the budget", or potential impact to operational forces that could be caused by delays in the delivery of Navy facilities due to reprogramming for additional funding. It should also be mentioned that although many authors describe accuracy with a common percentage for the range of accuracy for additional and less cost, in reality the cost tends to "creep" towards additional cost. This characteristic of estimating was apparent in the court cases researched. There were no cases in which the cost was less than estimated. The thesis author's opinion of "cost creep" is shown in Figure 1.

STANDARD CONTRACT REQUIREMENTS

In this section, the requirements of the American Institute of Architects Standard Agreement Between Architect and Owner, Document B141, 1987, the Engineer's Joint Contract Document Committee's Standard Form of Agreement Between Owner and Engineer for Professional Services, Document No. 1910-1, 1984, and the Atlantic Division, Naval Facilities Engineering Command Standard Contract for Architectural-Engineering Services, Document 5ND LANTDIV 4-4280/7 (8-67), are compared.

A review of the three above mentioned contract procedures shows that AIA B141 and EJCDC's agreement are very similar in requirements for preliminary estimates, while the NAVFAC agreement requires a detailed estimate for each phase of design. Since AIA B141 in many cases parallels EJCDC's agreement in form and content, these documents will be compared first, followed by a review of the NAVFAC contract requirements.

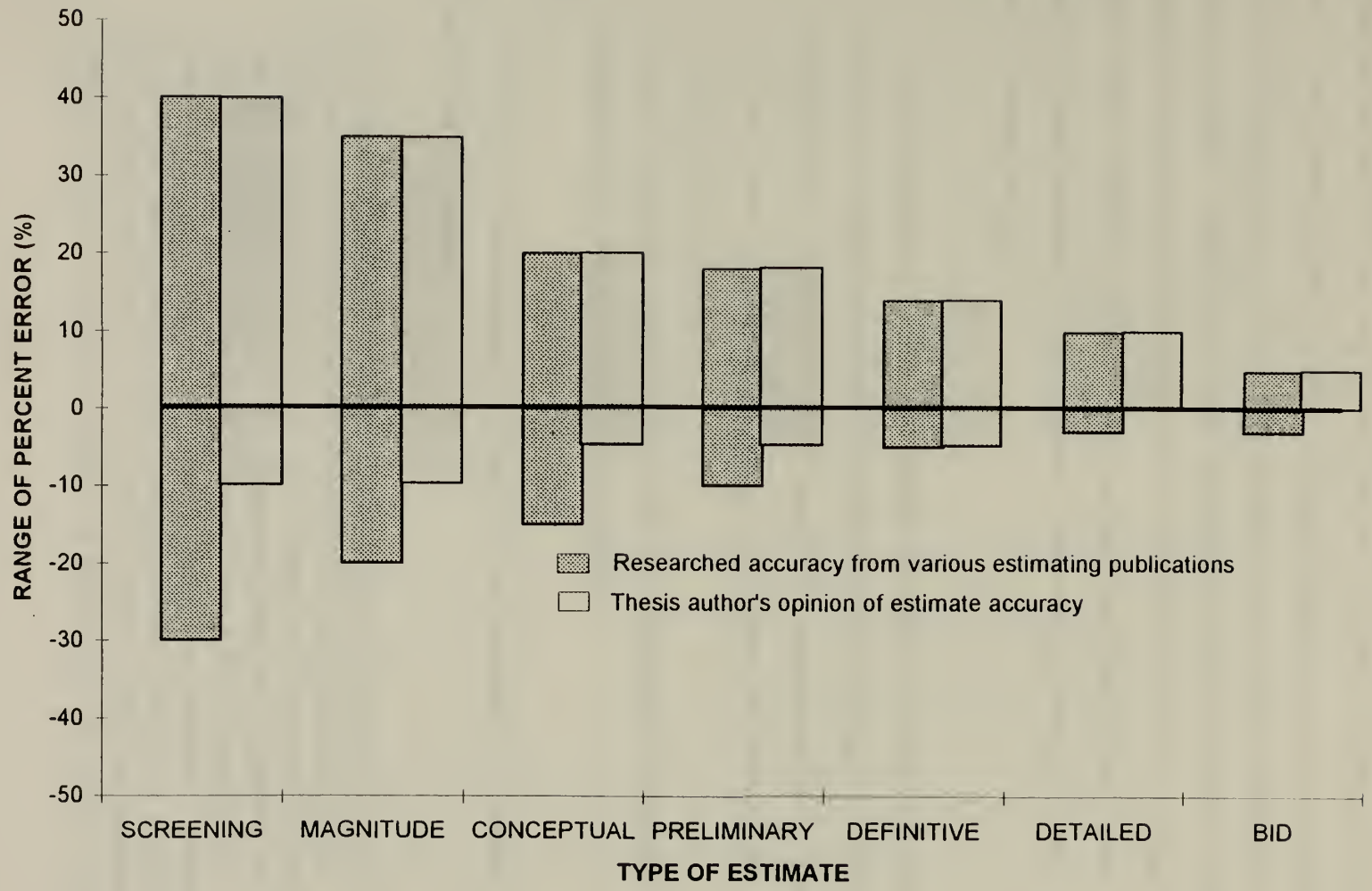


Figure 1 - RANGE OF ACCURACY FOR VARIOUS TYPES OF ESTIMATES

The AIA B141 agreement requires the architect to "submit to the owner a preliminary estimate of Construction Cost based on current area, volume, or other unit costs" in the "Schematic Design Phase" Subsequent adjustments to this preliminary estimate are required for the "Design Development Phase" and the "Construction Documents Phase". Similarly, the EJCDC agreement requires an "Engineer's opinion of probable costs for the project" in the form of "Total Project Costs" in the "Study and Report Phase", "Preliminary Design Phase", and the "Final Design Phase". Both documents require approval of the cost prior to proceeding to subsequent phases. Two minor differences are noted:

1 AIA B141 requires a "preliminary estimate of Construction Cost" whereas EJCDC requires an "Engineer's opinion of probable cost for the project" titled "Total Project Cost". Additionally, EJCDC specifies the requirement for "a breakdown of Construction Cost, Engineering costs and contingencies, costs of other consultants, cost of land, etc."

2. AIA B141 requires "owner approval" prior to proceeding to a subsequent phase whereas EJCDC requires "written authorization."

AIA B141 provides exculpatory language for the responsibility of construction cost, paragraph 5.2.1 states:

> Evaluations of the Owner's Project budget, preliminary estimates of Construction Cost and detailed estimates of Construction Cost, if any, prepared by the Architect, represent the Architect's best judgment as a design professional familiar with the construction industry It is recognized, however, that neither the Architect nor the Owner has control over the cost of labor, materials or equipment, or the Contractor's methods or negotiating conditions. Accordingly, the Architect cannot and does not warrant or represent that bids or negotiated prices will not vary from the Owner's Project Budget or from any estimate of Construction Cost or evaluation prepared or agreed to by the Architect. (AIA, ,987)

The EJCDC Document provides similar language, and in addition, EJCDC paragraph 6.2.1 states:

> If prior to Bidding or Negotiating Phase, the Owner wishes greater assurance as to Total Project or Construction Costs, the Owner shall employ an independent cost estimator as provided in paragraph 3.9 (EJCDC, 1984).

One significant difference in the contracts, is AIA B141 paragraph 3.4.10 provides for "detailed estimates of Construction Cost" under "Optional Additional Services." There is no comparable clause in the EJCDC document. The EJCDC attempts to make it clear that opinions of costs submitted by the engineer are not intended to be as accurate as cost estimates because most engineers are not qualified to nor wish to assume the responsibility of cost estimators. The owner is required to employ an independent cost estimator if he wishes greater assurance as to the actual project or construction costs (Clark, 1981).

The exculpatory language in both contracts concerning fixed limits of construction cost is a direct reflection of the sizable amount of litigation involving this area, the risks of the design professional associated with fixed limits, and the deliberate attempts by professional organizations to limit exposure to fixed limits. AIA B141, paragraph 5.2.2, states:

> No fixed limit of Construction Cost shall be established as a condition of the Agreement by the furnishing, proposal, or establishment of a Project budget, unless such fixed limit has been agreed upon in writing and signed by the parties hereto. If such a fixed limit has been established, the Architect shall be permitted to include contingencies for design, bidding and price escalation, to determine what material, equipment, component systems and types of construction are to be included in the scope of the Project and in the Contract Documents, to make reasonable adjustments in the scope of the Project and to include in the Contract Documents alternate bids to adjust the Construction Cost to the fixed limit. Fixed limits, if any, shall be increased in the amount of an increase in the Contract Sum occurring after execution of the Contract for Construction. (AIA, 1987)

EJCDC parallels this clause with paragraph 6.2.2.2 and paragraph 6.2.2.3. In addition, paragraph 6.2.2.2 provides for a "ten percent contingency unless another amount is agreed in writing" for fixed limits.

Concerning the time between design completion and bidding or negotiation, AIA B141 (paragraph 5.2.3) allows the architect to modify the estimate after 90 days to adjust for any change in market condition, whereas EJCDC allows for 6 months.

The contracts are also similar with regard to options for the owner when the fixed limit is exceeded. AIA B141 paragraph 5.2.4 and 5.2.5 state:

> If a fixed limit of Construction Cost (adjusted as provided in Subparagraph 5.2.3) is exceeded by the lowest bona fide bid or negotiated proposal, the Owner shall:
> .1 give written approval of an increase in such fixed limit;
> .2 authorize rebidding or renegotiating of the Project within a reasonable time;
> .3 if the Project is abandoned, terminate in accordance with Paragraph 8.3; or
> .4 cooperate in revising the Project scope and quality as required to reduce the Construction Cost. (AIA, 1987)

> If the Owner chooses to proceed under Clause 5.2.4.4, the Architect, without additional charge, shall modify the Contract Documents as necessary to comply with the fixed limit, if established as a condition of this agreement. (AIA, 1987)

The clause further states that this is the limit of the Architect's responsibility, and that the architect shall be entitled to compensation for all services performed whether or not the Construction Phase is commenced (AIA, 1987).

Atlantic Division Navy Facilities Engineering Command (NAVFAC) Requirements

In contrast to the preliminary estimates required by AIA B141 and EJCDC, NAVFAC requires a detailed cost estimate with each submittal: 35%, 100%, and Final. The specifications require that the estimate detail for each submittal shall be consistent with the level of design required for that submittal. The specifications state that accurate

quantity take-off, inclusion of all appropriate Cost Engineering System (CES) systems, and accurate unit prices are essential (Atlantic Division, NAVFAC, 1993).

For 35% design submittal requirements (comparable to AIA B141 Schematic Design Phase), the contract requires in part:

> The cost is to be based on a reasonably accurate take-off of materials/systems consistent with the level of design. For those elements of the project where the status of design does not permit a reasonably accurate take-off of quantities or firm pricing of individual items of work, systems unit prices may be used. The use of lump sum costs are not acceptable. Use of empirical costs shall be minimized. (Atlantic Division, NAVFAC, 1993)

For Military Construction (MILCON) Projects, a Parametric Estimating and Programming document is prepared for Congress to approve the programming and appropriation cycles. The document requires an Estimate Summary Sheet and Building Square Foot Cost Development Sheet with backup information. When a Parametric Estimating and Programming Document is required, no 35% design submittal is required.

Similar to AIA B141 and EJCDC regarding approval before proceeding to the next phase of design, NAVFAC states in part:

> It is very important that if the estimate indicates that the design exceeds the allocated funds, the Project Manager be contacted for instructions. (Atlantic Division, NAVFAC, 1993)

NAVFAC's 100% design requirements can be compared to the end of the AIA B141 Design Development Phase. Unlike AIA B141 and EJCDC, NAVFAC's requirement is similar to a Contractor's detailed estimate as described earlier in this chapter. The specifications require the provision of a narrative description of each system with the estimate, quotations for all items of substantial quantity or cost, price sources including company name, person contacted, and date of quote should be included. There

are little differences between the requirements of the 100% design submittal and the Final Design Submittal.

In NAVFAC contracts, Federal Acquisition Regulation clause 52.236-22 titled, Design Within Funding Limitations, is provided:

> (a) The Contractor shall accomplish the design services required under this contract so as to permit the award of a contract, using standard Federal Acquisition Regulation procedures for the construction of the facilities designed at a price that does not exceed the estimated construction contract price as set forth in paragraph (c) below. When bids or proposals for the construction contract are received that exceed the estimated price, the contractor shall perform such redesign and other services as are necessary to permit contract award within the funding limitation. These additional services shall be performed at no increase in the price of this contract. However, the Contractor shall not be required to perform such additional services at no cost to the Government if the unfavorable bids or proposals are the result of conditions beyond its reasonable control.
>
> (b) The Contractor will promptly advise the Contracting Officer if it finds that the project being designed will exceed or is likely to exceed the funding limitations and it is unable to design a usable facility within these limitations. Upon receipt of such information, the Contracting Officer shall review the Contractor's revised estimate of construction cost. The Government may, if it determines that the estimated construction contract price set forth in this contract is so low that the award of a construction contract not in excess of such estimate is improbable, authorize a change in scope or materials as required to reduce the estimated construction contract price. When bids or proposals are not solicited or are unreasonably delayed, the Government shall prepare an estimate of constructing the design submitted and such estimate shall be used in lieu of bids or proposals to determine compliance with the funding limitation.
>
> (c) The estimated construction contract price for the project described in this contract is (shown in Appendix A of the specifications). (Federal Acquisition Regulation 52.236-22, 1984)

Regarding paragraph (c) above, Appendix A of the contract specifications provides the Project Budget and "Design to" Estimated Construction Cost. It also provides authority to proceed in design at a cost in excess of the "Design to" Estimated Construction Cost and requires a contract modification.

This clause provides options for the Contracting Officer and requirements of the design professional should bids exceed the funding limitations. The specifications further state that when the cost limit is not met, the design professional requirements, in part, are as follows:

> Evaluate the bids and submit a comparison of cost between the low bid and the final Architect-Engineer (A/E) estimate. Reasons for major differences, sorted by specification division, must be stated with a recommendation to award or reject. This bid analysis must be provided within one week and at no additional cost to the government. (Atlantic Division, NAVFAC, 1993)

NAVFAC's specifications state that "the objective is to develop a final estimate that will be within 10% (+/-) of the lowest responsible bid."

SYNOPSIS

In summary, the literature indicates that consistencies exist concerning the accuracy of various types of estimates. The accuracy of a preliminary estimate at the point of a final revision should be close to 10%. This accuracy coincides with the requirements of AIA B141 and EJCDC's engineer-owner agreement. NAVFAC's goal is an accuracy of 10% but require detailed estimates. This may in some cases be more accurate, but is more expensive. It will be shown in subsequent chapters that the courts consider an error above 20% (the high end of what the literature revealed for a preliminary estimate) gross negligence when there is a cost limit in the contract.

CHAPTER 3

THEORIES OF RECOVERY

There are two theories of recovery that are most common among cases involving inaccurate cost estimates: breach of contract and negligence. The owner or the design professional can bring a suit for breach of contract. Breach of contract is based on the duties agreed to by the parties and required by the contract (Miller, 1992, p. 3). Owners can sue the design professional for negligence. Negligence, founded in tort law, is commonly defined as the lack of ordinary care. Negligence requires proof that a duty of care was owed, a breach of that duty occurred, and a relationship between the breach of duty and resulting measurable damages (Professional Design Insurance Management Corporation, 1981). To prove negligence, the design professional's performance must be shown to be unconscionable when compared to the acknowledged professional standard; the "standard of care, skill, and diligence that men in that profession ordinarily exercise under like circumstances." **Kostohryz v. McGuire**, 212 N.W.2d 850 (1973).

BREACH OF CONTRACT

In **Kostohryz v. McGuire**, 212 N.W.2d 850 (1973), Kostohryz, an owner, sued for damages under breach of contract. The court cited American Jurisprudence, 2d, which states in part:

> An architect who substantially underestimates, through lack of skill and care, the cost of a proposed structure, which representation is relied upon by the employer in entering in the contract and proceeding with construction, may not only forfeit his right to compensation, but may become liable to his employer for damages. However, one to whom an architect gives an estimate of cost may not recklessly proceed to make contracts which make the cost construction far above that estimated and then hold the architect responsible for the surplus expenditure. (5 Am.Jur.2d, Section 23)

The original cost estimate for the house which McGuire designed was $39,973. The actual cost for partial construction was $63,863 plus an estimated $20,000 for completion. The court denied McGuire's claim for fee recovery and awarded $7,000 in damages to Kostohryz.

NEGLIGENCE

Pipe Welding Supply Company, Inc. v. Haskell, Conner, and Frost, 96 A.D.2d 29 (1983), illustrates the theory of negligence. The owner terminated the project when informed that the bids exceeded the estimated cost by 33% to 45%. The architect had orally assured the owner that bids were always within 10% to 15% of the estimate. The owner produced expert testimony that the disparity was so great that the architects had not used skill, knowledge and judgment ordinarily possessed by proficient architects in the area, however, the opinion was rendered without knowledge of the method of estimation of any specifics of the project. By not examining the methods of estimation or the specifics (reasonable person theory), the owner failed to prove negligence.

The design professional can sometimes bring suit for recovery of fee based on quantum meruit. The theory of quantum meruit (sometimes discussed but seldom conclusive) is based upon benefit accepted or derived for which the law implies a contract to pay.

A suit may be brought about under various theories of recovery; breach of contract, negligence, or quantum meruit. It will be shown in the following chapters that the theory in which the suit is brought is dependent primarily on the intent of the parties.

CHAPTER 4

ACTIONS OF THE PARTIES

In analyzing of cases involving inaccurate cost estimates, it is helpful to understand the rules which are used by the courts in interpreting contracts. Some of the most prevalent rules used by the courts are as follows (Thomas, 1994):

1. The purpose of interpretation is to determine the intent of the parties. This is the primary objective of contract interpretation.
2. Secret or undisclosed intentions will not control, only those intentions that are expressed or are reasonably inferable will prevail.
3. A contract is to be enforced as made or written.
4. The clear and unambiguous language of the contract must not be ignored.
5. The intentions of the parties are best demonstrated by their actions during performance (actions speak louder than words).
6. A contract must be read as a whole.
7. A proper interpretation is to find harmony among all parts of the contract.
8. No provision or clause is treated as useless.
9. Specific language will control over general language.
10. General disclaimers are given limited weight and will not be allowed to override clear indications or positive representations, but specific disclaimers cannot easily be ignored.

One way to analyze liability for inaccurate cost estimates is to classify each case by the interpretation rule used by the court. The primary rules of interpretation are the plain meaning rule, patent ambiguity, actions of the parties, and interpretation as a whole (Thomas and Smith, 1994, p. 4-11). Using the primary rules, Thomas and Smith developed a decision diagram for disputes involving interpretation (Thomas and Smith,

1994, p. 8-3). Figure 2 is a modified version for interpretation of disputes involving inaccurate cost estimates.

PLAIN MEANING

The use of the plain meaning rule is often discussed and argued, however is seldom conclusive. One example where plain meaning is discussed is the case of **Stevens v. Fanning**, 207 N.E.2d 136 (1965). The plain meaning and intent of the phrase "approximate estimated cost" is discussed, however, the court ultimately interpreted the contract by reading it as a whole. The plain meaning rule states:

> Words employed in a contract will be assigned their ordinary meaning unless it shown that the parties used them in a different sense. (Calamari and Perillo, 1990).

Although the plain meaning rule "holds a very significant position in the rules hierarchy", the scope of coverage is limited to a specific word or phrase (Thomas and Smith, 1994, p. 8-2). Courts attempt to establish the meaning of the word or phrase as it pertains to the custom and usage in industry. The use of the plain meaning rule must be conclusive. If the case involves more than the plain meaning of a specific word or phrase, then another rule of interpretation must be used.

PATENT AMBIGUITY

Patent ambiguity is similar to the plain meaning rule with respect to significance as an interpretation rule, but has limited usage in interpreting cases involving inaccurate cost estimates. Patent ambiguity occurs when the ambiguity is so obvious, a contractor has a duty to inquire (Thomas and Smith, 1994, p. 8-4). In over 60 cases studied in this research, patent ambiguity was not once used as an interpretive rule Perhaps the

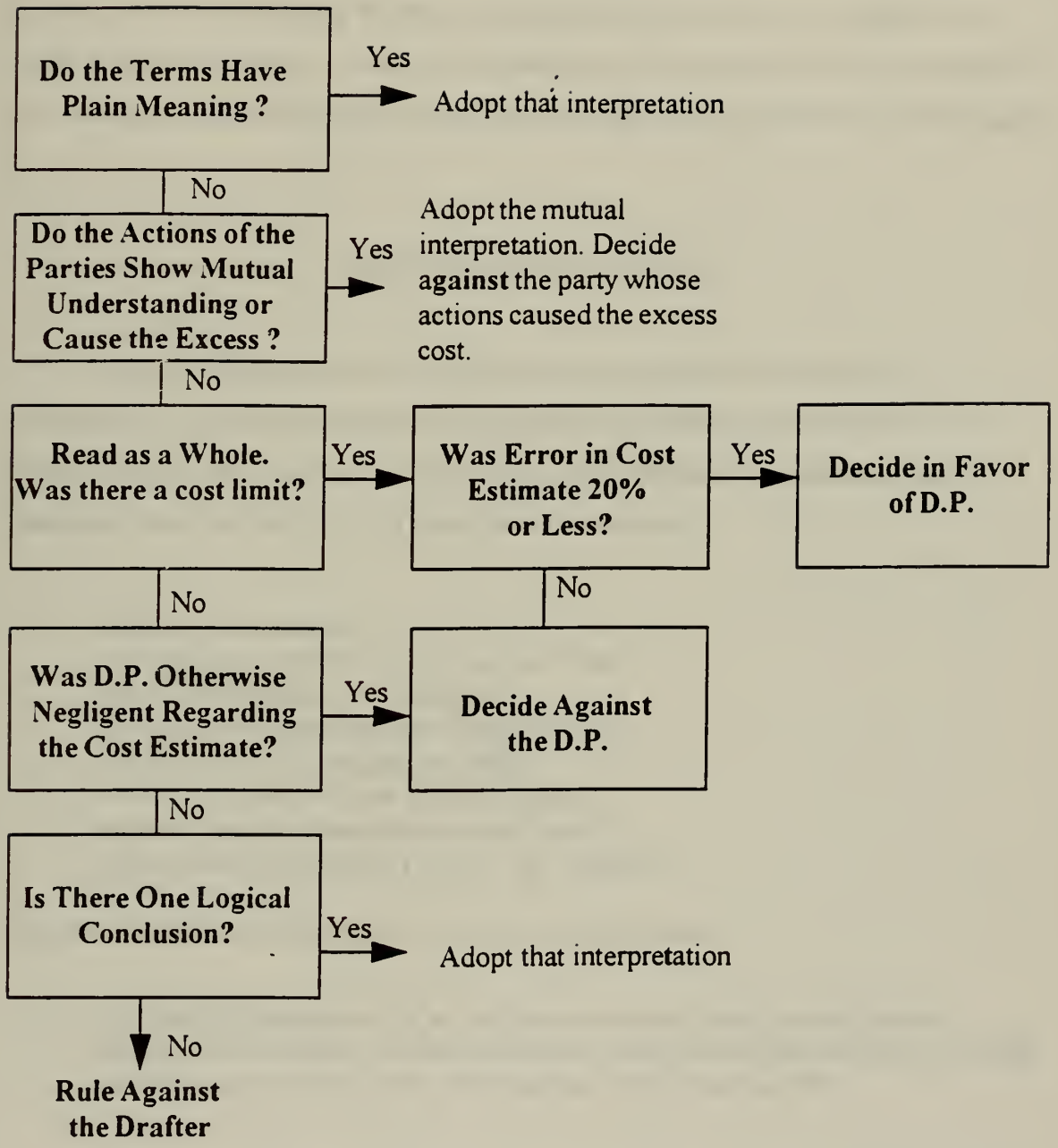


Figure 2 - DECISION DIAGRAM

reason is that the contract between the design professional and an owner is by nature different from the relationship between a contractor and an owner. It is unlikely that patent ambiguity will play a role in the interpretation of future cases involving inaccurate cost estimates. The rule is ignored, therefore, omitted from the decision flowchart, Figure 2.

ACTIONS OF THE PARTIES

A significant number of the cases involving inaccurate cost estimates are interpreted by reviewing the action of the parties during contract performance. With regard to actions of the parties, the appellate judge **in Williams Engineering, Inc. v. Goodyear, Inc.**, 496 So.2d 1012 (1986) cited Shakespeare:

> When we mean to build,
> We first survey the plot, then draw the model;
> And we see the figure of the house,
> Then must we weigh the cost of the erection;
> Which if we find outweighs the ability,
> What do we then but draw anew the model
> In few offices or at least desist to build at all?
> (Shakespeare, King Henry IV, pt 2, Act 1 Scene 3).

The rule of practical construction (action of the parties) states:

> A reasonable construction of an ambiguous contract by the parties thereto, although not conclusive, will be considered and accorded great weight, and usually will be adopted by the courts. (Restatement, 1981, Section 206)

There are several cases where the owner's actions were the cause of the excess cost, thus eliminating liability for the design professional. It is common for the design professional to recover the fee when the owner makes changes which substantially increase the cost, acquiesces to the increased cost, abandons the project, or in some other way causes the increase in cost.

Owner Actions - Ordering Changes

In **Bruno v. Gauthier**, 70 So.2d 693 (1954), the owner, Gauthier intended to spend $18,000 on a house designed by Bruno. The $18,000 was based on the fact that Gauthier was certain that she could save four or five thousand dollars by "being her own contractor" After discussion of the original ideas for the house, Gauthier required a number of changes and additions in the plans adding to the cost of the building. When the plans were received by the Gauthiers, they were completely satisfied except for the cost. No payment was made to Bruno who brought suit to recover the fee for design. The only figure pertaining to the actual cost was 2 1/2 years after receiving the plans. Gauthier wrote Bruno stating they could not use the plans as bids received were between $24,000 and $35,000. Bruno had complied with the contract. The court found that the reason Gauthier did not construct the house was failure to sell the house which he owned when the contract was signed.

In **Pieri v. Rosebrook**, 275 P.2d 67 (1954), Pieri, a homeowner, brought suit against the architect, Rosebrook, for damages caused by the actual cost of his home, $62,192, which exceeded an alleged agreement of maximum cost of $30,000. The homeowner ordered several major changes which increased the cost during design. The design professional told the owner that the changes would cost more money. The owner paid $50,000 in subcontracts before asking the design professional about costs or objecting to the costs. This action amounted to accepting the cost overrun. The court found in favor of the design professional.

Similarly in **Loewy v. Rosenthal, Inc.**, 104 F. Supp. 496 (1952), **Brown v. Cox**, 459 S.W.2d 471 (1970), and **Griswold and Rauma, Architects, Inc. v. Aesculapius Corp.**, 221 N.W.2d 556 (1974), the design professional's fee was recovered when owner directed changes caused the excess cost.

Illustrative example

Cobb v. Thomas

565 S.W.2d 281 (1978)

Facts.

Cobb, a homeowner, brought suit alleging breach of contract, breach of fiduciary duty and negligence in failing to keep cost of designing a home less than $500,000. The written contract contained no mention of a cost limit. During design, the owner made several changes which greatly increased the cost. The final plans were originally estimated to be above $500,000. At the request of the owner, Thomas, the architect, revised the plans and Sebastian, the owner's builder, confirmed that it could be built for under $500,000. However, Sebastian refused to build the house on a fixed cost basis, and the owner awarded the contract on a cost plus contract. After award, the owner suffered some unexpected financial difficulties and eventually stopped construction for 6 months.

Analysis and Conclusion

The court found that that the design professional did not show a lack of due care. In upholding the trial court's decision, the court found the reasons for excess costs were: (1) owners executed a cost-plus contract, (2) owners added extras, (3) owners suspended work for approximately 6 months due to their own financial difficulties. The court found in favor of the design professional.

Owner Actions - Abandonment

The design professional is entitled to compensation when the owner abandons the project. In the case of **Parrish v. Tahtaras**, 318 P.2d 642 (1957), the court found in

favor of Parrish, the architect, because the owner abandoned the project. At the time Tahtaras abandoned the project, Parrish was in the process of modifying the plans in accordance with the contract, to reduce the cost from $73,280 to the oral cost condition of $65,000. Similarly in **Mathews v. Neal, Greene, and Clark**, 338 S.E.2d 496 (1985), Mathews, the owner, abandoned the project because the cost was more than originally contemplated, and refused to pay the design fee. There was no cost limit and the architect followed the owner's requirements in design of the project. The only bid received was far in excess of the amount Mathews wanted to spend, however, the architect had no requirement for a cost estimate. The court stated:

> Where an architect is employed by the owner of land to prepare plans and specifications for the construction of a building thereon, and does so, and the owner decides not have the building erected, because of the estimated cost, but nevertheless retains the plans and specifications, in the absence of any guaranty as to the cost of the building, or agreement as to his compensation for preparing the plans and specification, the architect would be entitled to recover the reasonable value of his services in preparing the plans and specifications. (338 S.E.2d 496 (1985))

Abandonment can also be found when a party to a contract breaches the original contractual obligations and continues the project with another party. In **Jay Dee Shoes, Inc. v. Ostroff**, 59 A.2d 738 (1948), the design professional, Ostroff, presented a design that cost $25,000 to $30,000. In an effort to save money, the owner, stated he would hire his own superintendent, contractor, and subcontractors. During construction, the owner contracted with a different design professional to complete the remainder of the work, and stated that Ostroff was not entitled to the design fee because he did not stay within the alleged cost limit of $15,000. The court ruled in favor of Ostroff.

Owner Actions - Acquiescence

When a party to a contract ignores a problem by "burying their head in the sand" or pretending the problem does not exist, the actions may be construed as acquiescing or agreeing to the matter. In other words, the failure to object may be construed as agreement. Actions speak louder than words.

Such was the case in **Farnet v. Minyard**, 383 So.2d 440 (1980), where Farnet, the architect, brought suit to recover the design fee for a renovation project. The contract gave no mention to a cost limitation. Two bids were received; the lowest was $99,961. Minyard terminated the services of the architect, and claimed that there was a verbal understanding that costs for the project would not exceed $50,000. During performance, Farnet sent invoices to Minyard which noted that the estimated cost of construction was $100,000, and notified Minyard that the estimated cost was $100,000 during a review at the end of the preliminary design phase just prior to starting the construction documents phase. Minyard stated that he repeatedly told Farnet that he could not borrow or spend more than $50,000 and that he never agreed to construction costs of $100,000. Because the design professional submitted invoices on $100,000 and the owner made payments based on this amount, the court ruled in favor of the design professional.

Similarly in **Firmin v. Garber**, 353 So.2d 975 (1977), a design professional was able to recover the design fee after the owner failed to stop design on a project which was known to exceed the owner's financial capabilities. Garber, the owner, contracted with Firmin to prepare plans and specifications for the construction of a residence. The contract was a standard form AIA contract and contained no written limit. At trial, both parties conceded that the cost of construction was discussed during the negotiation of the contract. Firmin testified that Garber suggested $60,000 as a goal but that no maximum was established. Instead, Garber suggested that he could reduce the costs, since he operated an electrical and air conditioning company. Garber testified that the $60,000 amount discussed was a binding cost limitation. During the preparation of the plans and

specifications. Firmin informed Garber that the cost would exceed the cost range sought. Garber made no request to halt the preparation of the plans. The lowest qualified bid received was $105,320. Garber did not object to the plans but requested discussions to reduce the cost to the $60,000 range. After discussions, Firmin prepared a second set of plans which drew a bid of $79,240. Garber informed Firmin that he would postpone building for two years and declined to pay the architect's fee. Firmin invoked arbitration according to the contract. The arbitrator found for the architect. This decision was eventually upheld by the Supreme Court of Louisiana.

Illustrative Example

Moore v. Bolton

480 S.W.2d 805 (1972)

Facts.

Moore contracted with Bolton for design of a residence. During design, Bolton, the design professional, sent a letter requesting Moore's signature specifying that the fee would be 10% based on the construction cost. The letter contained no cost limit. Moore testified that it was not signed because there was no limit stated, but did not object to Bolton proceeding with the design. During design, Moore added changes which increased the cost. The plans were submitted to a builder who estimated the cost at $75,200, Moore's budget amount. The builders estimate was contingent on 35 deletions from the original plans. At no time during design did Moore stop Bolton's design work despite the additional work. Moore did not agree with any of the deletions that the builder suggested to reduce the cost, and stated they would worry about price later.

Analysis and Conclusions

Moore claimed a cost limit of $75,000, but the court in ruling for the design professional stated that actions speak louder than words. The court stated:

> The fact that the building may have cost more than the owner wanted is not material where there has been no fixed cost in the contract. (480 S.W.2d 805 (1972))

Owner Actions - Miscellaneous

Sweet states that a design professional who does not have flexibility due to stringent requirements may be less likely to be held liable (Sweet, 1968, p. 1006). In **Bueche v. Eickenroht**, 229 S.W.2d 911 (1949), Eickenroht, an architect, was able to recover where Bueche, an owner-builder, specified the size and details of a house, and stated that he did not want it to exceed $18,000. The design professional could not do both, and was faced with designing a house for $18,000, or designing a house that Bueche specified. The design was completed with regard to the specifications of the owner but exceeded the cost $18,000.

The owner's actions were paramount in **Arata v. Sunseri**, 147 So.2d 222 (1962). Arata entered into a contract with Sunseri to prepare plans to renovate an office building. The cost limit was $25,000 and the lowest bid was $39,000. The owner subsequently split the work into several contracts and proceeded with construction. Arata, seeing the work being done, sued for his fee. The testimony proved that the plans for the work being performed were essentially the same as what Arata had prepared. The court ruled that while it is true that an architect who fails to furnish plans and specifications substantially within an agreed cost limit is not entitled to a fee, it is also true that in such a case the owner cannot make use of the architect's plans without paying a fee.

Design Professional Actions - Designing in Excess of Owner's Requirements

Just as the owner's actions are paramount in showing intent of the parties, so can the actions of the design professional. Some of the design professional's actions that proved relevant in this research are:

- designing in excess of the owner's requirements
- acquiesence
- revising the drawings to reduce cost
- not adhering to the professional standard of care
- accuracy of the estimate

Discussion of several relevant cases follow. A design professional can be held liable for designing a project substantially different from the owners requirements. Such was the case in **Zannoth v. Booth**, 52 N.W.2d 678 (1952) and **Bruno v. Williams**, 76 So.2d 41 (1954). In the latter case, the architect, Bruno, brought suit to recover his fee for a house design. This was an oral contract. Williams testified that Bruno prepared plans that were substantially different from what Williams had sketched and substantially exceeded the maximum stated cost of $30,000. The house was bid for $55,000. The court ruled that where a limit is set the architect is not entitled to his fee if the plans which he prepares cannot be constructed except by the expenditure of an amount substantially in excess of the limit.

Design Professional Actions - Acquiesence

Similar to the cases describing acquiesence by the owner, a design professional's acquiesence can be construed as intent. In **Hirsch v. Kuhne** 149 So.2d 630 (1963), Hirsch brought suit against Kuhne, an architect, to recover $829 he had paid to Kuhne in fees for construction of a medical center in Luling, Louisiana. There was no cost limit written in the contract, but Hirsch claimed the cost was orally agreed not to exceed $55,000. The low bid was $89,937. Kuhne denied responsibility because the contract, adopted from a standard AIA document, states:

> When requested to do so the Architect will furnish preliminary estimates on the cost of the work, but he does not guarantee such estimates. (149 So.2d 630 (1963))

Hirsch was introduced to Kuhne by a mutual contractor friend. They discussed construction of the medical center. The contractor estimated the cost would not exceed $9/SF yielding a total of 6,140 square feet. Kuhne did not object or protest to this estimate and the contract was signed. The low bid was $89,937. Hirsch stated he could not accept this cost unless it was reduced to $55,000. The low bid was reduced to $79,760, and Hirsch again refused. Since the contract was silent regarding a cost limit, the court allowed parol evidence. During design, Kuhne sent statements to Hirsch expressly stating the estimate cost of construction was $55,000. This was conclusive evidence. The court held:

> An architect, who fails to furnish plans for a building within the agreed cost limit, is not entitled to his fee, and that parol evidence is admissible to supply omissions in a written contract with reference to the absence of cost limitation. (149 So.2d 630 (1963))

The architect was denied his fee, and Hirsch recovered the fee previously paid.

Design Professional Actions - Revising the Drawings

In standard contracts such as AIA B141 and the EJCDC owner-engineer agreement, the design professional is required to revise the drawings if the owner so chooses, at the design professional's expense but with the owner's cooperation. In **Caldwell v. United Presbyterian Church**, 180 N.E.2d 638 (1961) , Caldwell was hired to prepare plans and specifications for a building. There was an oral cost limit of $45,000. The low bid was $57,800. Caldwell testified that tracings of revised plans to reduce cost within the limit were made, however, there was no proof that blueprints which could actually be used by the church were ever provided. The court found that the low bid

substantially exceeded the cost limit and Caldwell did not comply with the contract in revising the plans.

Design Professional Actions - Standard of Care

The case of **Williams Engineering, Inc. v. Goodyear**, 496 So.2d 1012 (1986), relates to the standard of professional care. In this case, the design professional was held liable:

> ...not by giving an inaccurate initial estimate, but by failing to employ a professional estimator, failing to look at other water slides, failing to advise the owners about other contractual possibilities, and failing to provide revised cost estimates. (496 So.2d 1012 (1986))

Likewise, in **Stanley Consultants, Inc. v. H. Kalicak Construction Co.**, 383 F.Supp. 315 (1974), the design professional was hired to prepare a cost estimate for an apartment building in Zaire. The estimated cost was $8 million and the bid amount was $16 million. The estimate was prepared with little or no market data from Zaire. The court found that the design professional did not meet the standard of what a reasonable design professional would have done.

In **Kellogg v. Pizza Oven, Inc.**, 402 P.2d 633 (1965), the design professional underestimated cost due to a math error. Suit was brought by the owner against the architect for failing to design and supervise construction of a restaurant building. The contract contained a cost limit of $60,000. During construction, the architect approved various bids for the work without regard to the total amount awarded. There was also ample testimony that the architect made no attempt to recheck the original estimate, and when they were requested to supply a detailed cost breakdown, they utilized former erroneous estimates and made no effort to recalculate their figures. Futher testimony revealed that if Kellogg's figures had been rechecked, Kellogg would have discovered the almost 40% excess in costs. The architect failed to check the various bids as they came in and approved them without regard to the total, and the building was more than half way

completed before they did so. A check of the bids before the contracts on them were let would have revealed immediately the cost to be in the area of $90,000. The general rule describing the duty of an architect is found in 5 Am.Jur.2d., Architects, Section 23, as follows:

> An Architect who substantially underestimates, through lack of skill and care, the cost of a proposed structure, which representation is relied upon by the employer in entering in the contract and proceeding with construction, may not only forfeit his right to compensation, but may become liable to his employer for damages. (5 Am.Jur.2d, Section 23)

The architect was negligent in the mathematical computations of his estimate.

Design Professional Actions - Accuracy of the Estimate

The standard of professional care is an important factor in determining negligence. Some courts have stated that a design professional cannot recover compensation for his services if the cost of the building constructed according to his plans exceeds the maximum limit specified (20 A.L.R. 3d., p. 783). More often, courts have established the rule that a design professional cannot recover compensation for his services if the cost of the building constructed according to his plans substantially exceeds the maximum limit specified (20 A.L.R. 3d., p. 783). The question arises, what amount or percentage "substantially exceeds" that specified? American Law Reports has published an annotation on this subject, which notes,

> Although the courts have not formulated any general rules concerning the effect of the percentage of excess on the right to recover compensation, it seems significant that the number of decisions denying recovery of compensation on proportion to the number of decisions allowing recovery increases rapidly as the percentage of excess cost increases from less than 25% to 25 through 75% to over 75%". (20 A.L.R. 783)

In reference to whether or not a cost condition has been fulfilled, Sweet states that "roughly 10% seems to be accepted, although this figure might be reduced if the project were large and the fee justified continual detailed pricing takeoff" (Sweet, 1994, p. 203). Sweet further states "that the more specific the amount of the cost limitation, the more likely a small tolerance figure will be applied." (Sweet, 1994, p. 203) A review of Chapter 2 shows that estimating publications consider an error of 10% to be the degree of accuracy for the final revision of preliminary estimates (preliminary estimates are required in standard contracts of AIA and EJCDC). NAVFAC's goal for estimates in contracts with design professionals is an accuracy of 10 %. The EJCDC contains a 10% contingency regarding fixed limits, and prior to 1977, AIA B141, contained a 10% bidding contingency (Sweet, 1994, p.203). Furthermore, in providing the design professional with a self rating system, the Design Professional Insurance Company recommends a poor rating if a design professional finds that cost estimates are exceeded by more than 10% on over 20% of jobs (Design Professional Insurance Company, 1988, p. 54).

Although 10% is an estimate that is easily related to and has been mentioned in standard contract language and estimating publications, the review of decisions in this research suggest that a more accurate percentage which courts seem to consider gross negligence is 20%. The court in **Kunz v. Torbeck**, 31 Ohio L.R. 373 (1928), stated, "where the cost exceeds by more than 20% the estimate given by the architects, the cost is not approximately or reasonably near the proposed amount or estimate." 31 Ohio L.R. 373 (1928). However, in the case of **Griswold and Rauma v. Aesculapius**, 221 N.W.2d 556 (1974), the court did not find a 13% error substantial, although there were other relevant factors. A review of the three cases mentioned in American Law Reports where the design professional was precluded from recovery when the excess was under 25%, shows the lowest error in which recovery was not allowed was roughly 23% in the case of **Wuellner v. Illinois Bell Tel. Co.,** 60 N.E.2d. 867 (1945). There are several cases which may be useful in determining the lower limit of error. In are **Pipe Welding Supply Co. v. Haskell, Connor, and Frost**, 96 A.D.2d 29 (1983), the court stated that a 10 to 25%

error is common. A 10% variation was considered normal in **Kellogg v. Pizza Oven, Inc.**, 402 P.2d 633 (1965).

Appendix B, Table B-1, lists the cases researched where the percent error could be calculated from the reporter. A review of Table B-1 shows that in all of the cases researched where the error was below 20% (with the exception of the case of **Torres v. Jarmon**, 501 S.W.2d 369 (1973), where the changes made in reducing the percent error to 13% substantially changed the building) the design professional was not held liable. Figure 3 graphically illustrates design professional liability for inaccurate cost estimates as a function of the percent error. A review of Figure 3 appears inconclusive, however, when the cases are removed where the owner's actions caused the increase in cost, shown in Table B-2 and graphically in Figure 4, the consistency of the courts is apparent. Figure 4 shows when a cost limit is present, a design professional is liable when the error in the cost estimate is greater than 20%.

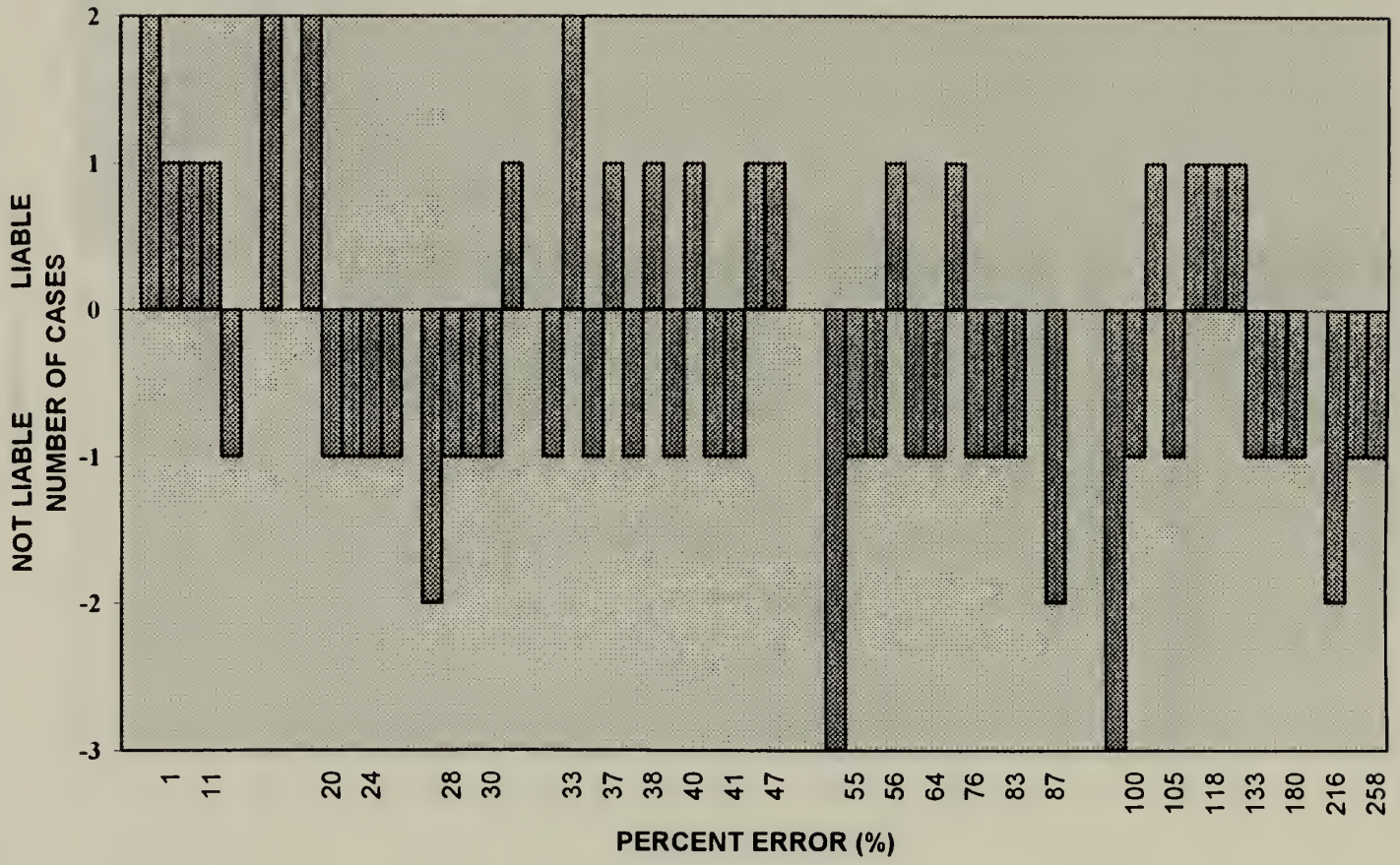


Figure 3 - DESIGN PROFESSIONAL LIABILITY VS. COST ESTIMATE PERCENT ERROR

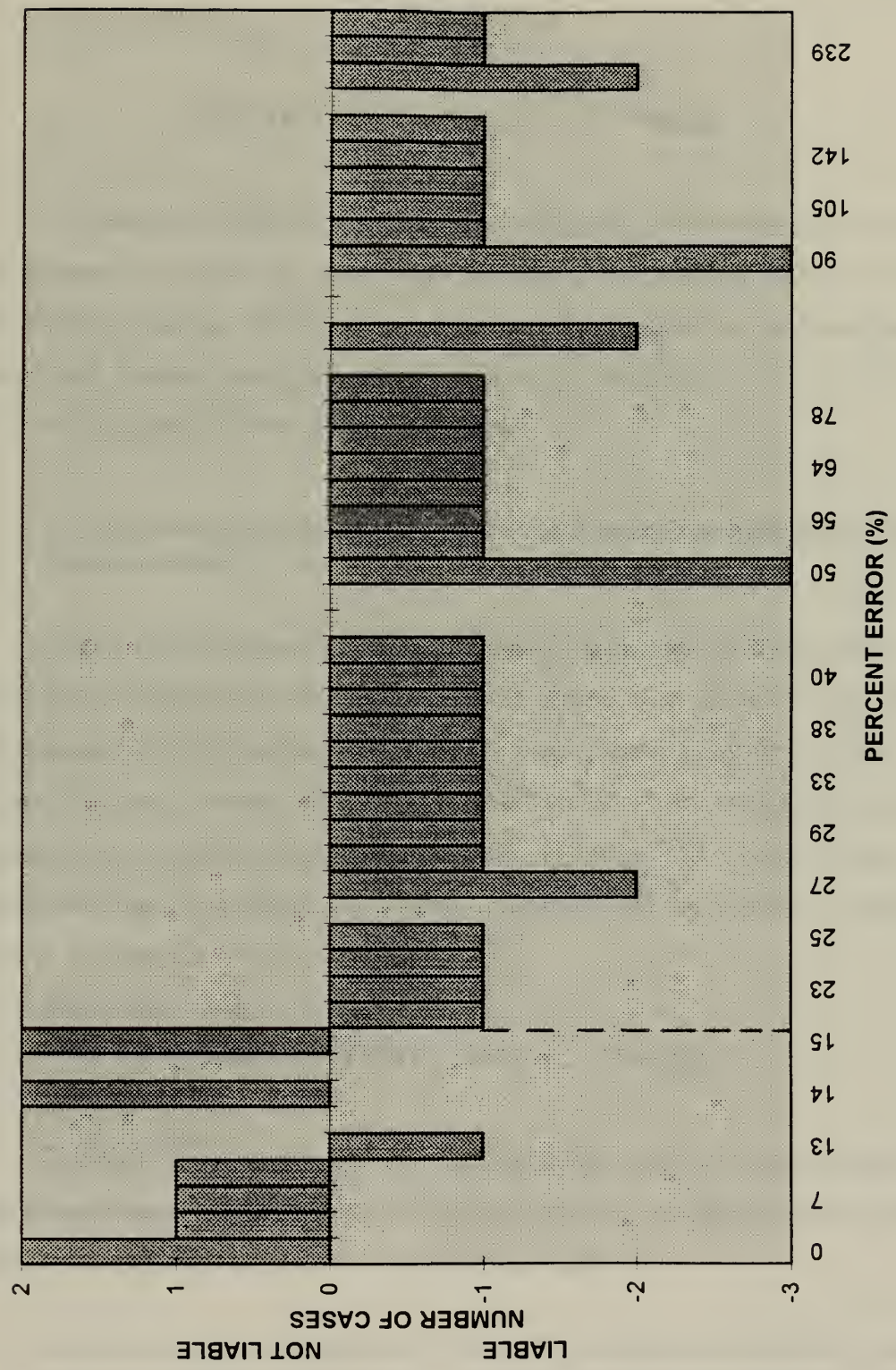
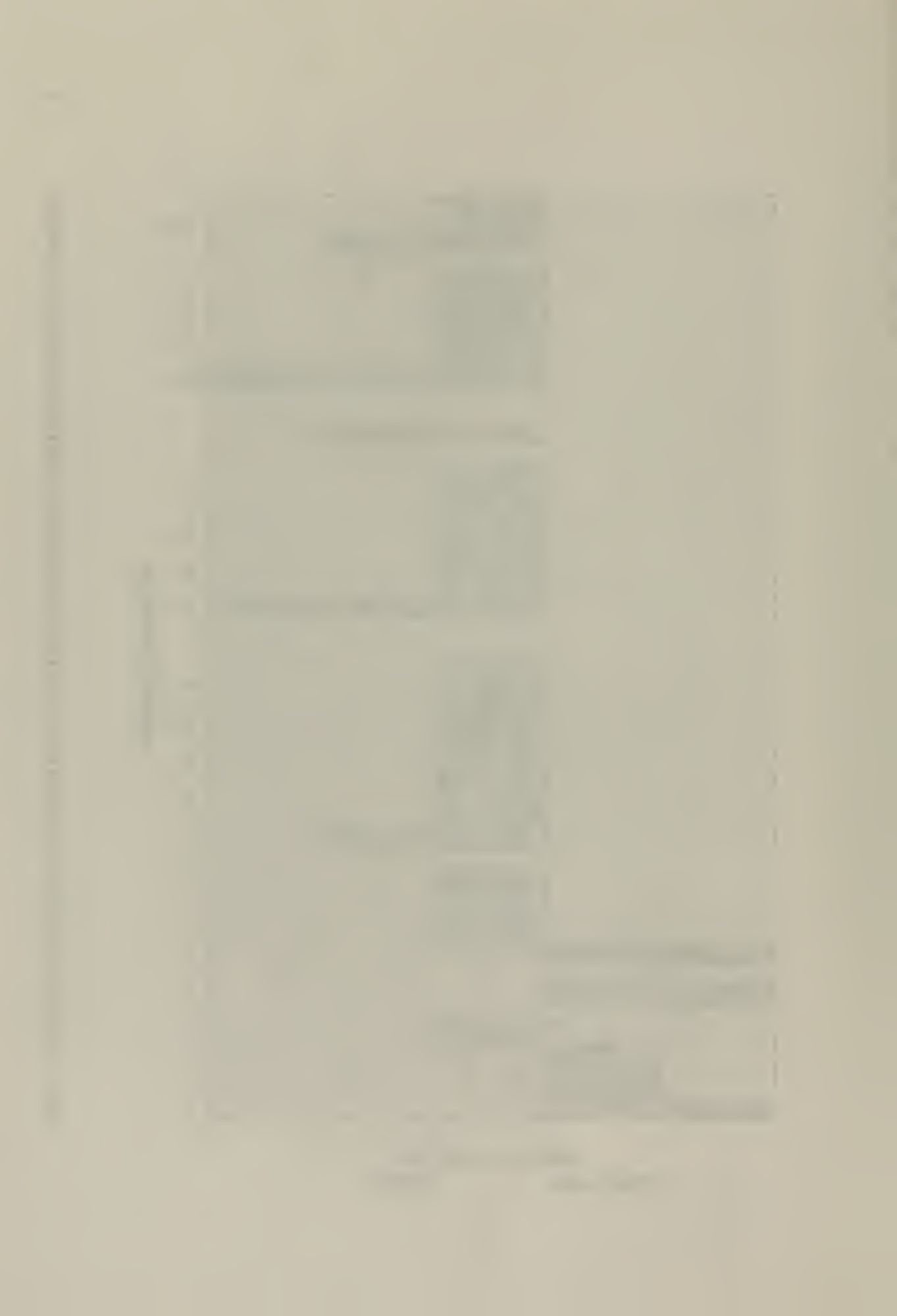


Figure 4 - DESIGN PROFESSIONAL LIABILITY VS. COST ESTIMATE PERCENT ERROR (NO FAULT OF OWNER)



CHAPTER 5

READ THE CONTRACT AS A WHOLE

To determine the intent of the parties, a court must give consideration to all parts of an agreement. In reviewing the contract as a whole, the court will consider the "four corners" of the contract. All provisions of the contract should be read to harmonize the contract such that no part is rendered useless (Thomas and Smith, 1994, p. 4-14). The rule for interpreting the contract as a whole states:

> A contract must be construed as a whole and, whenever possible, effect will be given to all its parts. (5 Am.Jur.2d, Section 25)

There are several cases involving inaccurate cost estimates that have been interpreted by reading the contract as a whole. In general, there are three types of cases involving reading the contract as a whole: cases where there is a cost limit written in the contract (Category I), cases where there is a cost limit established through parol evidence (Category II), and cases where there is no cost limit (Category III). A list of cases decided using the rule "interpret the contract as a whole" and the respective category is shown in Appendix B, Table B-3.

WRITTEN COST LIMITS (CATEGORY I)

Cost limits can be established by written language in the contract (Category I). When interpreting a contract, a court will first determine (1) if a fixed cost limit existed, and (2) if meeting the fixed limit was a condition of payment.

> An architect may not be entitled to recover his fee where he has failed to design a project which can be constructed within a cost limitation where failure to comply is

considered to be a condition precedent to payment. **Malo v. Gilman**, 379 N.E.2d 554 (1978), **Stevens v. Fanning**, 207 N.E.2d 136 (1965), **Spitz v. Brickhouse**, 123 N.E.2d 117 (1954).

As noted earlier, professional organizations such as AIA and EJCDC in their standard form contracts have attempted to shield themselves from liability resulting from cost limitations. For example AIA B141, paragraph 5.2.2 states:

> No fixed limit of Construction Cost shall be established as a condition of the Agreement by the furnishing, proposal, or establishment of a Project budget, unless such fixed limit has been agreed upon in writing and signed by the parties hereto. If such a fixed limit has been established, the Architect shall be permitted to include contingencies for design, bidding and price escalation, to determine what material, equipment, component systems and types of construction are to be included in the scope of the Project and to be included in the Contract Documents, to make reasonable adjustments in the scope of the Project and to include in the Contract Documents alternate bids to adjust the Construction Cost to the fixed limit. Fixed limits, if any, shall be increased in the amount of an increase in the Contract Sum occurring after execution of the Contract for Construction. (AIA, 1987)

In addition, paragraph 5.2.3 provides for "adjustment by the Architect if negotiation or bidding has not commenced within 90 days after the Construction Documents have been submitted to the owner." (AIA B141, 1987). Paragraph 5.2.4 provides specific options for the owner where the fixed limit is exceeded by the lowest bona fide bid (AIA, 1987). Similar language appears in the standard EJCDC owner-engineer agreement. Sometimes design professionals choose to accept the risk of accepting a fixed cost limit written in the contract. In **Clark v. Madeira**, 477 S.W.2d 817 (1972), the contract called for designing plans for renovation of the Madeira's home for "approximately $23,000". The actual job cost was $43,000. The court stated that Friberg, the architect, who was a partner with Clark, the builder, could not profit by his own wrong. The court stated:

> An architect, whose cost estimate is culpably below the actual cost of the job is not entitled to a commission upon the excess. (477 S.W.2d 817 (1972))

The applicable rule concerning fixed limits (established by written language or through parol evidence) is:

> An architect holds himself out as an expert in his particular line of work and is employed because he is believed to be such, and in making estimates, he may not be negligent in exercising the skill and judgment which those employing him have the right to expect; therefore, where plans are required for a building which does not cost more than a certain sum, or are accepted on condition that it can be constructed for an amount specified by the architect, he cannot recover compensation for his services in this regard if the cost of the building constructed according to his plans, substantially exceeds that specified. (3 Am.Jur.2d, Section 17)

Most of the cases in this research were based on the traditional method of project delivery. Perhaps this case presents how a court might treat a design-build firm (an increasing method of project delivery with little case history) involved in a cost estimate dispute.

In **Stevens v. Fanning**, 207 N.E.2d 136 (1965), Fanning, a Chevrolet dealer, contracted with Stevens to design a building for his dealership. The contract provided that the building was to be "a multiple purpose building suitable to the needs of the owner, at an approximate estimated cost of $250,000." 207 N.E.2d 136 (1965) The case involved a misunderstanding about whether the limit applied to a pre-stressed concrete or steel framed design. The court found that the parties contracted solely for a specific type of building type (pre-stressed concrete) at a given price, and it is undisputed that the architect did not produce such building at the agreed price. In ruling against the design professional, the court stated:

> There may be no recovery for engineering or architectural services where the actual cost of the structure substantially or unreasonably exceeds estimated cost limitation, unless cost excess is attributable to owner's action. (207 N.E.2d 136 (1965))

Similarly in **Durand Associates, Inc. v. Guardian Investment Co**., 183 N.W 2d 246 (1971), Durand, the architect, was bound to a cost limitation which was written in the contract and was held liable for substantially exceeding the limit.

Illustrative Example

Torres v. Jarmon

501 S.W.2d 369 (1973)

Facts.

Torres, an architect, brought suit to recover his fee for services for design of a veterinary hospital for "approximately $70,000". The owner, Jarmon, was a traveling salesman. Jarmon's friend, Fisher, worked closely with Torres in design as Jarmon was going to lease the facility to Fisher. Torres prepared plans and specifications which detailed a "first-class" veterinary hospital. The low bid for construction was $133,000, which the court stated "was greatly in excess of the fixed limitation of approximately $70,000." 501 S.W.2d 369 (1973). Torres did not question that the low bid was greatly in excess of the fixed limit. Recovery was sought upon the contract which provided:

> The relevant Section in the contract is paragraph 3.5.1, which states in part:
>
> If the lowest bona fide bid or negotiated proposal, the Detailed Cost Estimate, or the Statement of Probable Construction Cost exceeds such fixed limit of Construction Cost (including the bidding contingency) established as a condition of this Agreement, the Owner shall ..... (3) cooperate in revising the Project scope and quality as required to reduce the Probable Construction Cost. In the case of Option (3) the Architect, without additional charge, shall modify the Drawings and Specifications as necessary to bring the Construction Cost within the fixed limit. The providing of such service shall be the limit of the Architect's responsibility in this regard, and having done so, the Architect shall be entitled to compensation in accordance with this Agreement. (501 S.W.2d 369 (1973))

Fisher chose Option (3) of paragraph 3.5.1 and Torres made 12 to 20 changes in the original plans that were approved by Fisher. Some of these were substantial changes such as eliminating the second floor. The cost was negotiated with the low bidder to $79,000. The proposal was rejected and the hospital was never built.

Analysis and Conclusion.

The Court of Civil Appeals of Texas, in affirming the trial courts decision to deny fee recovery, stated:

> It is settled law in this state that if a positive cost limitation is stipulated in an architect's employment contract, a substantial violation thereof will preclude recovery. Here appellants concede that the contract contains a fixed limitation of "approximately $70,000", and it is undisputed that the bid of $133,000 is a substantial violation of such limitation. (501 S.W.2d 369 (1973))

The remaining question was, Did Torres comply with part (3) of paragraph 3.5.1.? By Torres' own testimony, the plans were modified and the contract amount was reduced to $79,000. The court stated:

> In this situation, it cannot be said that such subsequent proposal fulfilled appellants' obligations under Option (3) of the contract. In any event, there is no finding, and we cannot say as a matter of law, that a proposal of $79,000 would be within the fixed limitation of "approximately $70,000." (501 S.W.2d 369 (1973))

The fact that Torres, the design professional, was able to reduce the percent error from 90% to 13% and still was precluded from fee recovery appears inconsistent with several cases. However, the changes to the plans and specifications were substantial. As a last note, it is worth mentioning that Jarmon never had any contact with Torres, and Fisher, the potential leasee worked directly with Torres in proposing a "first class facility". Additionally, Torres admittedly did not know that the contract contained an express cost

limit. The court ruled in favor of the owner **This case presents the importance of "reading the contract."**

COST LIMITS ESTABLISHED THROUGH PAROL EVIDENCE (CATEGORY II)

When a contract is ambiguous or incomplete, for example when the contract is silent on cost, the courts may use parol evidence to fill the void. Early versions of the standard AIA agreement were silent on fixed cost limits, thus parol evidence was used frequently. A partial list of these cases follows:

Bair v. School District 94, 146 P. 347 (1915)
Almand v. Alexander, 23 S.W.2d 611 (1930)
Loyal Order of Moose v. Faulhaber, 41 N.W.2d 535 (1950)
Wick v. Murphy, 54 N.W.2d 805 (1952)
Rosenthal v. Gauthier, 69 So.2d 367 (1953)
Spitz v. Brickhouse, 123 N.E.2d 117 (1954)
Caldwell v. United Presbyterian Church, 180 N.E.2d 638 (1956)

Recent editions of standard contracts specifically address fixed limits. However, it is worth noting that no contractual provision, however well drawn, will ensure that the client will not be able to bring his contention before the court in the form of parol evidence (Sweet and Sweet, 56 Calif.L.Rev. 1005, 1968). The use of parol evidence involves intangibles such as the judge's opinion and how the evidence is presented. Such intangibles are beyond the scope of this research as it becomes increasingly difficult for an owner or a design professional to determine how the courts may view their situation when

the agreement is oral or based on oral agreements. It is worthwhile, however, to review cases that involve cost limits determined by the use of parol evidence.

In **Wick v. Murphy**, 54 N.W.2d 805 (1952), the court established a cost limit through parol evidence. The owner, Murphy, was seriously concerned with the cost of a renovation project on his home and communicated an $8,500 limit to Wick, the architect. The low bid of $14, 959.80 (75% greater than the maximum) was rejected by the owner. The court stated:

> ...that it could not be assumed that the parties intended at the time the contract was executed that the plaintiff's were to receive a fee for their services based upon a rejected bid substantially in excess of the maximum cost limit. (54 N.W.2d 805 (1952))

The contract contained ambiguous language concerning the basis for payment. The court stated:

> If plaintiff's interpretation of the contract were sustained, it would follow that they would be entitled to a fee based on the lowest bona fied bid received for doing the work regardless of the amount of the bid or the letting any contract. (54 N.W.2d 805 (1952))

Paragraph 2 of the Schedule of Professional Practice, which is part of the agreement, provided that the basic rate would be based upon the total cost of the work completed. Paragraph 10 defined "cost of work" as the total of the contract sums incurred for the execution of the work. Since no construction contract was let, the basic rate could not be determined. The court ruled:

> To sustain the plaintiff's meaning would render useless the paragraphs which allow for computing the basic rate of payment. A basic rule to contract interpretation is that a contract must be read as a whole thus no clause is to be rendered useless. (54 N W.2d 805 (1952))

Wick, the architect, was not able to recover the design fee. Two other cases which contain the same situation and similar contract language regarding payment are **Loyal Order of Moose v. Faulhaber**, 41 N.W.2d 535 (1950), and **Wetzel v. Roberts**, 295 N.W. 580, (1941).

In the case of **Durand Associates, Inc. v. Guardian Investment Co.**, 183 N.W.2d 246 (1971), the owner, after being presented with a contract which contained the statement "Cost Estimate $629,000", called the architect on the phone and stated, "This building is to be built for $420,000 as previously discussed." The design professional agreed there had been an error and the contract was changed to $420,000. The architect testified that the figure was a preliminary figure for payment. The owner testified that it was a cost limit. No other discussions of cost were mentioned. The court, in ruling for the owner, stated:

> It strains credulity to believe any businessman or private corporation would enter into a substantial building project without insisting on some estimate of cost. (183 N.W.2d 246 (1971))

In cases involving oral agreements parol evidence, the decision rests with the court by weighing what is many times conflicting testimony by the parties. **In Rock v. Enelow**, 292 So.2d 756 (1974), Rock, an architect, entered into an oral contract with Enelow to build a two story apartment building. Enelow testified that there was a maximum cost of $100,000 including fees, and that the fee was contingent on the cost. Rock testified that he never agreed to this condition and the fee was a percentage of cost, non-contingent. The low bid was $115,000. Rock sued for 3/4 of 4 1/2% of the low bid, $115,000 (since his services also included construction monitoring and this was not accomplished). The court ruled that the fee was not a contingent fee, however, a cost condition of $100,000 did exist. The court awarded Rock the design fee.

Similarly, in the case of **Rowell v. Crow**, 209 P.2d 149 (1949), parol evidence was used to establish a cost limit. Rowell entered into an oral agreement to design plans

for a hotel renovation project for Crow Crow testified that payment was conditioned on a maximum amount of $250,000 based on his ability to borrow only $125,000, and "if Rowell could prepare plans within this amount then he could proceed." When the lowest bid was received in the amount of $598,819, Crow refused to proceed. Rowell contended that there was no proof of the cost limit. The jury believed the testimony of Crow.

In **Rosenthal v. Gauthier**, 69 So.2d 367 (1953), a heavily cited case, Rosenthal appealed for recovery of fee for design of a one story masonry clinic and hospital. The contract was an standard form of agreement issued by the American Institute of Architects, and was silent with regards to a cost limitation. The trial judge allowed parol evidence to determine the intent of the parties with regard to a cost limitation. Gauthier testified that there was a verbal agreement and understanding as to a cost limitation of the building beginning at $60,000, and being progressively raised after numerous discussions to $100,000, including architects and contractor's fees. Rosenthal denied emphatically that there was any cost limitation. When the bid was received for $123,490, Gauthier told Rosenthal that $100,000 was his top limit and that the deal was off if he could not reduce the price. The judge weighed the testimony provided by both parties and ruled in favor of the owner, Gauthier. Similar decisions were reached in the following cases:

Eberhard v. Mehlman, 60 A.2d 540 (1948)

Goldberg v. Underhill, 213 P.2d 516 (1950)

Tsoi v. Ebenezer Baptist Church, 153 So.2d 592 (1963)

Spurgeon v. Buchter, 192 Cal. App.2d 198 (1961)

Rose v. Shearer, 431 S.W.2d 939 (1968)

Illustrative Example

Spitz v. Brickhouse

123 N.E. 2d 117 (1954)

Facts.

Spitz, an architect, brought suit against Brickhouse for recovery of the design fee of $2,675 for designing a house. The contract was silent as to the style, number of rooms, dimensions, the quantity, and quality of materials. Brickhouse and his wife met with Spitz at the proposed lot. Brickhouse asked Spitz if he could build a five and a half or six-room house, ranch style, if Brickhouse provided the lot, for $25,000. Spitz answered, "I believe so, yes; and we can make it a beauty." At a later conference, Spitz asked for a retainer of $250, 10 percent of the fee. Spitz presented a contract. Brickhouse asked what it meant and Mr. Spitz answered, "It means that when you build a house, we are your architects. This is to keep you from changing horses in the middle of the stream." Brickhouse repeated that the cost of the house was not to exceed $25,000. Spitz said that was correct and when the house was built our fee will be $2,500. Brickhouse testified that when he was informed that the house would cost from $39,000 to $44,000 he told Spitz he could not finance such a home. Spitz denied ever discussing a maximum cost.

Analysis and Conclusions.

Because the contract was silent regarding the maximum cost, the court used parol evidence to determine that there was indeed a condition of maximum cost of $25,000. The court found:

> ..that to sustain Spitz' contention that the cost is to be determined by the lowest bona fide bid, it would be necessary to hold that no matter how large the bid for doing the work, the owner would be obligated to pay an architectural fee based on that amount. (123 N.E. 2d 117 (1954))

The written language of the contract renders this testimony of doubtful credibility. The contract provided that the fee should be "computed on a reasonable estimated cost." Unless some "reasonable estimated cost" had been agreed upon, it would render meaningless the "basic rate" for the determination of the architect's fee. In reading the contract as a whole, the court harmonized the contract. The rule "no clause is rendered useless" was applied.

Statutory Regulations and Funding Limitations

Government regulations and statutory funding limitations can become part of the whole agreement when the design fee is contingent on such limitations. A design professional performing services for NAVFAC must comply with the Design Within Funding Limitation clause (Federal Acquisition Regulation 52.236-22, 1984). Similar requirements might also be found in state and local government projects. Such was the case in **Beacham v. Greenville County**, 62 S.E. 2d 92 (1950). Beacham, an architect, was hired by Greenville County to prepare plans to remodel and expand the courthouse. The contract was silent to cost. The County was limited by statute and authority to $400,000. The architect was aware of this funding limitation. During design, the architect reported that he thought the work could be done for $400,000. The low bid was $863,000. The architect sued for a fee based on $863,000. The court cited 127 A.L.R. 413 in stating:

> Where an architect is employed by the state or by a political subdivision thereof, it has generally been held that he may not recover compensation for preparing plans for a structure which will cost more to erect than such governmental unit is permitted by law to expend for the purpose. (A.L.R., Section 127, p. 413)

NO COST LIMIT (CATEGORY III)

The cases in the first two sections of this chapter deal with cases that were decided fundamentally by reading the contract as a whole, and where a cost limit was established as a condition of payment. But how have the courts viewed inaccurate cost estimates in cases where there was no cost limit stated in the contract, any discussions of a cost limit, or any meeting of the minds concerning cost of the project?

The court looked to the wording of the contract in **Jetty, Inc. v. Hall-McGuff Architects**, 595 S.W.2d 918 (1980). The court found that the parties had not agreed on a fixed limit, and that the contract, a standard form AIA, stated that any cost limit must be in writing. The design professional gained approval of and provided revised estimates as required by the contract. The court stated:

> The fact that the building may have cost more than the owner wanted is not material where there has been no fixed cost in the contract. (595 S.W.2d 918 (1980))

The percent error is not known, however, the design professional gained approval of revised estimates from the owner at the various phases of design.

The design professional was also able to recover the fee in **Kahn v. Terry**, 628 So.2d 390 (1993), where the contract stated cost limits must be in writing, and there was no such evidence of a written cost limit. The percent error in the estimate was 37%. It should be noted that there appears to be a math error in the case report. The percent error can also be calculated as 2%.

Likewise in **Moossy v. Huckabay**, 283 So.2d 699 (1973), it was determined that the written language was complete. During design, Moossy, an architect, presented Huckabay with revised estimates, the last of which was $499,216. Huckabay was commendatory of Moossy and expressed satisfaction. The contract stated that in the

event that no "acceptable" bids were received, he was to receive 7% of 75% of the estimated construction cost. The low bid was $821,018, an error of 74%. The plans and specifications were revised to an estimated cost of $472,000, however, the contractor who was the low bidder advised Huckabay that the revisions were impractical. Huckabay terminated the contract with Moossy, and hired another designer. Moossy, who claimed for 7% of 75% of $821,018 recovered his fee based on the final estimate of $499,216. Despite the written language in this contract, it should be noted that there was a dissenting opinion in this case that has merit based on the amount being "materially in excess" of the amount specified.

In **Kleinschmidt, Brassette, and Associates, Inc. v. Ayres**, 368 So.2d 1153 (1979) the question was raised, Does the design professional have a duty to inform the owner of his estimate of final cost where there is no agreed upon cost limitation or no requirements for providing an estimate? Kleinschmidt brought suit to recover fees under an oral contract for architectural services rendered to Ayres in connection with a proposed construction of a residence. In weighing the evidence, the court concluded that the proof fell short of establishing that there was a meeting of the minds on the architectural fee or how it was to be computed, and that the anticipated cost of constructing the house was not mentioned at any time before the plans were completed.

Ayres was satisfied with the completed plans until she received her first construction bid of $145,000. Later Kleinschmidt got another bid for $125,000 or $129,000. Shortly thereafter, Ayres went on vacation and lost interest in the project. Ayres contended that Kleinschmidt could not recover any fees as they failed to advise her of the final cost of construction. The court cited a few landmark cases:

> Where an architect is employed to prepare plans and specifications for a building and there are no cost limitations agreed upon, such architect can recover compensation for his services irrespective of the costs of construction. **Moossy v. Huckabay Hospital, Inc.**, (283 So.2d 699 (1973))

> If no cost limitations are agreed upon, the architect has no obligation to inquire into or to keep himself informed of his clients financial status. **Guirey, Srnka, and Arnold, Architects v. City of Phoenix**, (449 P 2d 306 (1969))

In ruling the court stated:

> The defendant's contention that she has not received any benefit from the house plans is not well taken. She accepted the final plans and they were submitted to two contractors, who bid on the construction of the home. Although Ayres said that both bids greatly exceeded the amount which she expected to spend, apparently such figures were not prohibitive and beyond all consideration because she stated that she still may build the home in the future. (368 So.2d 1153 (1979))

The interpretation in **Baylor v. Carlander**, 316 S.W.2d 277 (1958), was based on the clear and unambiguous language of the contract. The design professional was not held liable where the contract contained no cost limitation and where a cost limitation was intentionally excluded by the parties. Carlander, an architect, sued for services in designing a Bible Building, and recovered his fee. Carlander was aware that Baylor only had approximately $600,000 for the project, and knew his design was greater than $600,000 (his estimate was approximately double in cost). Moreover, he was designing to previously approved preliminary plans and specifications. The contract was written such that Carlander had no obligation to design the building considering cost, and was only required to provide an estimate when requested to do so. The University never requested an estimate and Carlander did not disclose one. Carlander recovered the design fee.

Similarly, the design professional was able to recover the design fee in **Getzschman v. Miller Chemical Co., Inc.**, 443 N.W.2d 260 (1989). The owner, contracted with the architect, Getzschman, to design a house. There was no cost limit in the contract. The owner requested numerous changes which increased the cost, however,

relieved the architect from performing cost estimates in exchange for more frequent site visitations during construction. The owner had planned to hire a contractor friend to estimate the cost but did not until the design was complete. Just prior to bid, while at lunch with the owner, the architect orally "guessed" a cost 100% lower than the subsequent bid amount. Because there was no limit in the contract, and Getzschman had no duty to estimate the cost, the court ruled against the owner and awarded Getzschman the design fee.

In **Kurz v. Quincy Post 37 American Legion**, 283 N.E.2d 8 (1972), there was no cost limit in the contract. The Legion Post contracted with Kurz, an architect, to design a Legion Building. Preliminary plans were drawn and Kurz estimated costs at $100,000. The Legion requested changes to allow for a renter to use the building resulting in a revised estimate of $122,000. Kurz then discovered soil problems and proposed three options ranging in cost from $130,000 to $231,000. After the Legion chose an option, the estimate was revised to $150,000 to $160,000. The low bid was $205,000, and the architect in working with the contractor reduced the bid to $182,000. The Legion decided not to move forward with the project. Parol evidence was introduced and it was determined that there was not an agreed to maximum cost. The court found in favor of the architect who recovered his fee.

SYNOPSIS

Reading the contract as a whole is an important rule of interpretation. Several cases have been presented where this rule was used, Table B-3 Figure 5 shows three cases where the design professional was not liable and the percent error was greater than 20%. In all three cases, there was no cost limit. In the cases, **Kahn v. Terry**, 628 So.2d 390 (1993), 37% difference, **Moossy v. Huckabay Hospital, Inc.**, 283 So.2d 699 (1973), 74% difference, and **Getzschman v. Miller Chemical Co., Inc.,** 443 N.W.2d 260 (1989), 100% difference, the written language of the contract stated that any fixed limit

must be in writing. There was no written evidence of any such agreement. The courts held in favor of the design professionals. It has been stated:

> Where the cost of construction is not fixed in the agreement employing an architect, nor estimated by him, but the plans are prepared according to details dictated by the owner, it has been held that the fact that the plans when completed call for a building which will cost more to erect than the owner expected, or willing, to pay, will not preclude the architect from recovering compensation for his services in making the plans. (3 Am.Jur., Section 13, p. 219)

It is also noted that these contracts were not silent on the issue of cost limits but specifically address the issue. A court cannot ignore the clear and unambiguous language of the contract. When the contract is silent on cost, the courts will fill the void by using parol evidence to establish a limit. In this case, the design professional will be held liable (barring other factors), for errors greater than 20%, however, when there is no cost limit, the design professional will not be liable. Although it appears as though the design professional may be given more flexibility with regard to error when there is no cost limit in the contract, this does not preclude liability if negligence can be proven by method of estimating or otherwise.

When there is more than one reasonable interpretation of a contract, the court as a last resort after all other rules have been exhausted will, as a consequence, rule against the drafter (Patterson, 1964). Ruling against the drafter is frequently discussed however seldom applied. With regards to inaccurate cost estimates, the consequence of "ruling against the drafter" has been cited in **Wick v. Murphy**, 54 N.W.2d 805 (1952) and **Spitz v. Brickhouse**, 123 N.E. 117 (1954). However, a careful reading of these cases reveals that although the judge discussed this action, the decision was based on "reading the contract as a whole". In the case of **Wick v. Murphy**, 54 N.W.2d 805 (1952), the rule "no clause is rendered useless" was prevalent. In **Spitz v. Brickhouse**, 123 N.E. 117 (1954), parol evidence was used to establish a cost limit where the design professional guaranteed the cost.

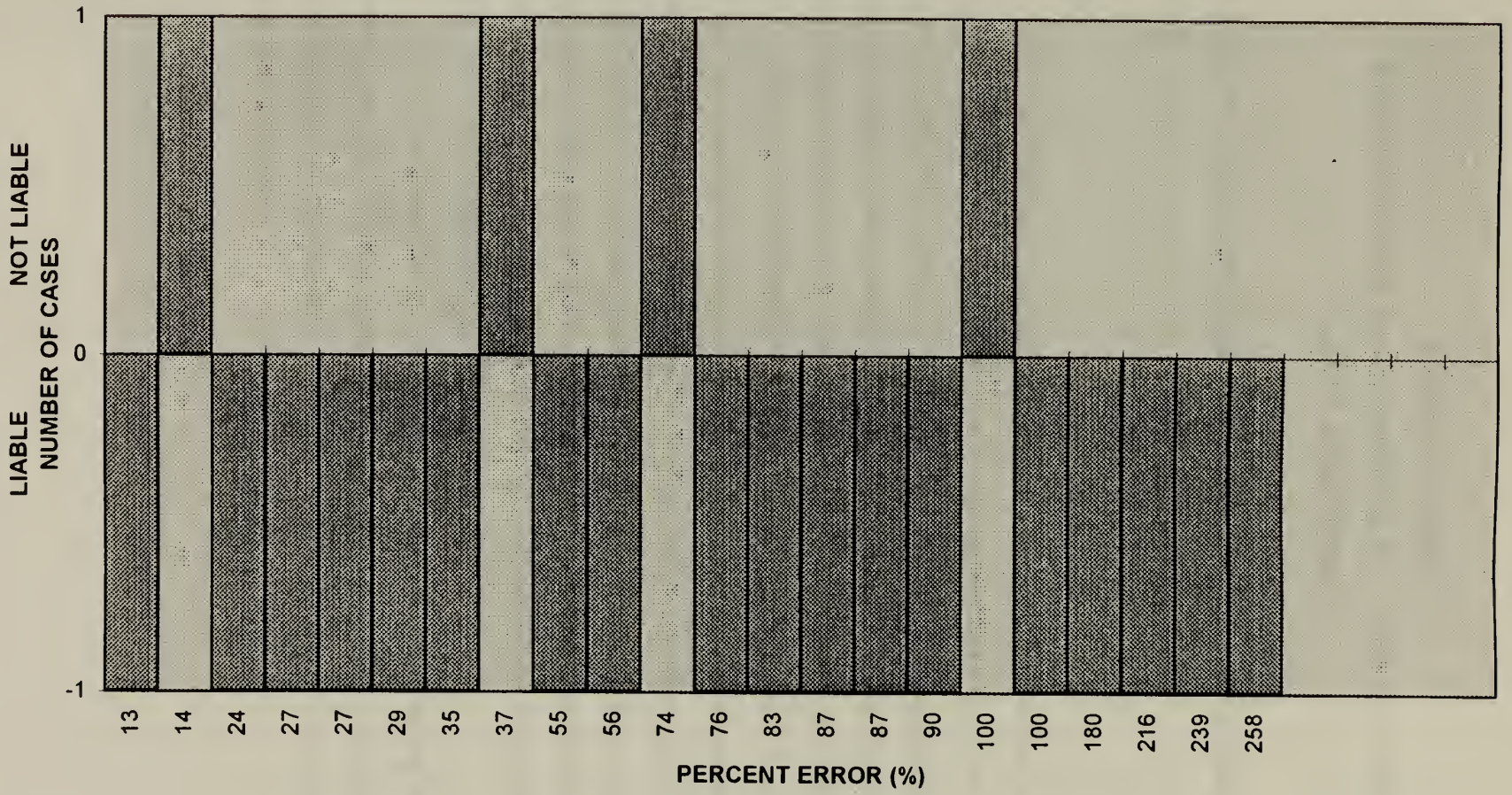


Figure 5

DESIGN PROFESSIONAL LIABILITY VS. COST ESTIMATE PERCENT ERROR (READING THE CONTRACT AS A WHOLE)

Illustrative Example

Guirey, Srnka, and Arnold Architects, Inc. v. The City of Phoenix

449 P.2d 306 (1960)

This illustrative example demonstrates the use of the interpretation decision diagram, Figure 2

Facts.

The City of Phoenix contracted to design a stadium. The contract was silent concerning a cost limitation and there were no oral agreements. The owner's funding situation changed several times during design, but was originally around $750,000. The architect's original estimate was $831,398, and later revised to $963,978. The owner requested the architect make changes to the design to reduce the cost. The architect was able to reduce the cost down to $918,478. Although the owner knew the cost was over $168,000 more than the funds available, the decision was made to accept bids since as the City stated, "they were still dealing with estimates." Bids were received and the lowest bid was $790,282. The owner requested the architect revise the plans to a maximum cost of $532,300, another new amount of available funds. After the parties were unable to reduce the cost to an acceptable amount, the owner requested the architect design a new stadium, which was eventually built.

The architect sued for the amount of effort required for designing both stadiums. The owner contended that the second stadium design was a revision of the first stadium, and that the architect was required to make revisions without additional compensation because the first proposal was unsatisfactory.

Analysis and Conclusions.

Do the terms have plain meaning? The rule is not applicable in this case.

Do the actions of the parties show mutual understanding or cause the excess? No. The City of Phoenix understood the design of the new stadium to be a revision of the original proposal (which was unacceptable to the owner) and required by the contract. The design professional designed the new stadium with the understanding that there would be additional compensation.

Read the contract as a whole. Was there a cost limit? No. There was no cost limit established in writing or by parol evidence. The City revised the requirements several times because of their funding situation, which amounted to the design professional trying to "hit a moving target".

Was the design professional otherwise negligent regarding the cost estimate? No. The design professional followed the contract and performed the requirements in a professional manner.

Is there one logical conclusion? Yes. The reason the original stadium submittal was unacceptable to the owner was not because of the design professional, but because the owner's funding situation changed. The owner did not provide clear instructions regarding cost.

The appellate court ruled that where there was no maximum cost condition, the architect was entitled to compensation for his services. The court cited **Texas Delta Upsilon Foundation v. Fehr**, 307 S W. 2d 124 (1957), which stated:

> Unless the architect is given clear instructions with regard to maximum cost, it is not the architect's province to keep himself informed as to the financial ability of his client. (307 S.W. 2d 124 (1957))

The court further stated:

> If we were to affirm the lower courts ruling we would be saying in effect that all a city has to do to avoid compensating an architect under Arizona law is to find that the proposal is unsatisfactory. Such a ruling would allow cities to hire architects at will to design any number of speculative buildings, but avoid compensating the architect when the city determines there is not enough funds to pay for the construction even though they were aware that the estimated cost was above the funds available. An owner should use judgment in a reasonable manner before rejecting the plans. (449 P.2d 306 (1960))

CHAPTER 6

SUMMARY AND CONCLUSIONS

This chapter includes a summary, conclusions, and recommendations for future research regarding design professional liability for cost estimates.

Summary of Chapters

Chapter one is an introduction to disputes involving cost estimates. The chapter provides the problem statement, objective, and methodology used to accomplish the research. The problem is there is not a clear understanding of cases involving inaccurate cost estimates. The objective is to define the conditions and relevant factors under which a design professional can be held liable to an owner for inaccurate cost estimates. The method used to accomplish the tasks is the study of literature, standard contracts, and appellate court cases.

Chapter two defines different types of cost estimates and compares the accuracy associated with each type. The requirements for cost estimates of standard contracts of AIA, EJCDC, and NAVFAC are compared. The different types of estimates in order of increasing accuracy are screening/planning, order of magnitude, preliminary, budget, conceptual, definitive, detailed, and engineer's estimate. The accuracy ranges from 40% to less than 5% error.

In comparing the standard contract documents, AIA B141 and the EJCDC Owner-Engineer agreement were similar in requirements. However, the NAVFAC standard contract requires detailed estimates whereas AIA B141 and the EJCDC contract require only preliminary estimates. In AIA B141, detailed estimates are an optional additional service. The EJCDC recommends the owner hire a cost consultant if a detailed estimate is required.

Chapter 3 explains the theories of recovery for disputes involving inaccurate cost estimates: breach of contract and negligence. Breach of contract is based on the duties agreed to by the parties and required by the contract (Miller, 1992, p 3). Both an owner and design professional can bring suit for breach of contract.

Negligence relates to the professional standard, and is commonly defined as the lack of ordinary care (Professional Design Insurance Management Corp., 1981, p.8). To prove negligence, the design professional's performance must be shown to be unconscionable when compared to the professional standard. The design professional can bring suit for recovery of fee based on quantum meruit. The theory of quantum meruit is based upon benefit accepted or derived for which the law implies a contract to pay. When an owner is able to use the plans prepared by the design professional for construction, the design professional's claim for recovery based on quantum meruit is strengthened because benefit may be shown. The theory in which the suit is brought is dependent primarily on the intent of the contractual language and actions of the parties.

Chapter 4 establishes the primary rules for interpretation of disputes involving inaccurate cost estimates: plain meaning, patent ambiguity, actions of the parties, read the contract as a whole, and rule against the drafter. The chapter outlines cases that were decided by the actions of the parties and discusses the percent error that courts have determined to be gross negligence of the design professional. The chapter also defines the percent error which constitutes gross negligence as stated by the courts, and the conditions and relevant factors under which a design professional can be held liable for cases involving cost limits.

Although standard contracts and literature frequently mention 10% error as an acceptable accuracy, a review of court decisions suggest that 20% error constitutes gross negligence when there is an established cost limit.

Chapter 5 examines cases that have been decided based on the rule "read the contract as a whole". The cases are classified into three categories: written cost limits (Category I), cost limits established through parol evidence (Category II), and no cost

limit (Category III). A discussion is provided on cost limits and parol evidence. Unlike when there is a cost limit, the courts have not held design professional's liable for an inaccurate estimate when there is no requirement to design to a maximum cost. Several cases rely on the written language in the contract pertaining to fixed limits. Although the research shows where there was no fixed limit the design professional was not held liable for an inaccurate estimate, it reasons that there could be liability based on negligence.

Chapter 5 concludes with a discussion of the "rule against the drafter", and provides a decision diagram for interpreting disputes involving inaccurate cost estimates.

Conclusions

The two primary rules of interpretation that were used most frequently to interpret cases involving inaccurate cost estimates are: (1) actions of the parties, and (2) read the contract as a whole. The existence of a cost limit in the contract which is a condition of payment, written or established through parol evidence, is paramount. Courts have been reluctant to hold a design professional liable on the basis of percentage of error as alone factor, however a 20% error seems to constitute gross negligence on the part of the design professional when the contract contains a cost limit. In cases where there was no cost limit, but the contract specifically addressed a cost limit, the clear and unambiguous language of the contract cannot be ignored. It is noted that this study was based on appellate level court cases only, which causes some built in bias. Many cases involving inaccurate cost estimates are not reported. For example, AIA provides for arbitration before prior to a court resolution. Furthermore, many cases are simply not appealed.

One important aspect of disputes involving cost estimates that was noted was the concept of "scope creep". In numerous cases, as the design progressed, the estimate increased. There were no cases that were to the contrary. Additionally, there were no cases where the design professional was sued for overestimating the cost.

Standard contracts have attempted, with some success, to shield the design professional from liability through the use of exculpatory language, however, it cannot be relied upon. As shown by this research, actions of the parties and reading the contract as a whole is paramount in determining liability.

Recommendations for Future Research

The following topics are recommendations for future research:

1. Most cases in this research involve the Traditional Method of project delivery, however, Construction Management and Design-Build delivery systems are frequently used. The Construction Manager and Design-Builder have assumed cost estimating duties in some situations. Are they held to the same standard as design professionals? Appendix A provides a brief summary concerning liability of Construction Managers, however, the research is inconclusive.

2. Some recent cases have considered the method that the design professional used to prepare the estimate. The study of estimating methods in this research was based on estimating publications. A survey of design professionals in industry would help to pinpoint the industry standard pertaining to accuracy and methodology, and help define the professional standard.

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Appendix A

PERCENT ACCURACY FOR VARIOUS TYPES OF ESTIMATES

Table A-1

PERCENT ACCURACY FOR VARIOUS TYPES OF ESTIMATES

Author	Type of Estimate	% Accuracy (+/-)
Clark et al., 1997	Screening	40
Neil, 1982	Early planning	40
Sinclair, 1989	Order of magnitude	35
Pilcher, 1994	Order of magnitude	25
Merritt, 1975	Magnitude	20 to 25
O'Brien, 1985	Concept or Budget	20
Clark et al., 1997	Budget	20
Merritt, 1975	Conceptual	15 to 20
Sinclair, 1989	Preliminary	18
Pilcher, 1994	Preliminary	15
Merritt, 1975	Preliminary	13 to 15
Ahuja and Walsh, 1983	Preliminary	10 to 15
Sinclair, 1989	Definitive	-10 to + 14
Merritt, 1975	Definitive	10 to 13
Pilcher, 1994	Detailed	10
O'Brien, 1985	Detailed	5 to 10
Sinclair, 1989	Detailed	5 to 10
Neil, 1982	Definitive	5
Ahuja and Walsh, 1983	Detailed	5
Steven, 1995	Detailed	5
Halpin, 1985	Engineer's estimate	3 to 5
Merritt, 1975	Engineer's or bid estimate	3 to 5

Table A-2

RANGE OF ACCURACY FOR VARIOUS TYPES OF ESTIMATES

Type of Estimate	Percent Range of Accuracy (+/-)
Screening/Planning	30 to 40
Order of magnitude	20 to 35
Conceptual/Budget	15 to 20
Preliminary	10 to 18
Definitive	5 to 14
Detailed	< 5 to 10
Engineer's/Bid	3 to 5

Appendix B

DESIGN PROFESSIONAL LIABILITY AND PERCENT ERROR

Table B-1

DESIGN PROFESSIONAL COST ESTIMATE ERROR AND COURT DECISION

No.	Title	Citation	% Error	Decision
1	Farnet v. Minyard	383 So.2d 440 (1980)	0	d.p. recovered fee
2	Marquis v. Laureston	40 N.W. 73 (1888)	0	originally 60% error. d.p. revised drawings to 0% error. d.p.recovered fee
3	Coombs v. Beede	36 A. 104 (1896)	1	d.p. recovered fee
4	Vaky v. Phelps	194 S.W. 601 (1917)	7	d.p recovered fee
5	Impastato v. Senner	190 So.2d 111(1966)	11	d.p. recovered fee
6	Torres v. Jarmon	501 S.W.2d 369 (1973)	13	No recovery of fee
7	Griswold and Rauma, Architects, Inc. v. Aesculapius Corp.	221 N.W.2d 556 (1974)	14	d.p. recovered fee
8	Kurz v. Quincy Post 37 American Legion	283 N.E.2d 8 (1972)	14	d.p. recovered fee
9	Bissell v. McCormack	162 Was. 482 (1931)	15	d.p recovered fee
10	Rock v. Enelow	292 So.2d 756 (1974)	15	d.p. recovered fee
11	Brooklyn Sav. and Loan Assoc. v. Tousley	16 Ohio C.C. N.S. (1907)	20	No recovery of fee
12	Wuellner v. Illinois Bell Tel. Co.	60 N.E.2d 867 (1945)	23	No recovery of fee above original fixed amount
13	Rosenthal v. Gauthier	69 So.2d 367 (1953)	24	No recovery of fee
14	Kunz v. Torbeck	31 Ohio L.R. 373 (1928)	25	No recovery of fee
15	Stevens v. Fanning	207 N.E.2d 136 (1965)	27	No recovery of fee
16	Bruno v. Williams	76 So.2d 41 (1954)	27	No recovery of fee
17	Caldwell v. United Presbyterian Church	180 N.E.2d 638 (1956)	28	No recovery of fee
18	Spurgeon v. Buchter	192 Cal.App.2d 198 (1961)	29	No recovery of fee
19	De Armond v. Tappan	85 Pa. Super. 236 (1925)	30	No recovery of fee
20	Cobb v. Thomas	565 S.W.2d 281 (1978)	32	d.p. recovered fee. owner actions (ordered changes)

Table B-1

DESIGN PROFESSIONAL COST ESTIMATE ERROR AND COURT DECISION

No.	Title	Citation	% Error	Decision
21	Bruno v. Gauthier	70 So.2d 693 (1954)	33	d.p. recovered fee. owner actions (ordered changes)
22	Capital Hotel Co. v. Rittenberry	41 S.W.2d 697 (1931)	33	No recovery of fee
23	Jay Dee Shoes v. Ostroff	59 A.2d 738 (1948)	33	d.p. recovered fee. owner actions (abandonment)
24	Rose v. Shearer	431 S.W.2d 939 (1968)	35	No recovery of fee
25	Kahn v. Terry	628 So.2d 390 (1993)	37	d.p. recovered fee (no fixed limit)
26	MacDonnell v. Dreyfus	81 So. 383 (1919)	38	No recovery of fee
27	Pipe Welding Supply Co. v. Haskell, Conner, and Frost	96 A.D.2d 29 (1983)	38	d.p. recovered fee. owner failed to prove negligence
28	Williar v. Nagle	71 A. 427 (1908)	39	No recovery of fee
29	Brown v. Cox	459 S.W.2d 471 (1970)	40	d.p. recovered fee. owner actions (ordered changes)
30	Graham v. Bell-Irving	91 P. 8 (1907)	40	No recovery of fee
31	Reynolds v. Long	154 S.E.2d 299 (1967)	41	No recovery of fee
32	Moore v. Bolton	480 S.W.2d 805 (1972)	44	d.p. recovered fee. owner actions (acquiesced)
33	Harrison v. McLaughlin Bros., Inc.	70 A. 424 (1908)	47	d.p. recovered fee. owner actions (ordered changes)
34	Andry and Feital v. Ewing	130 So. 570 (1930)	50	No recovery of fee
35	Malo v. Gilman	379 N.E.2d 554 (1978)	50	No recovery of fee
36	Kellogg v. Pizza Oven, Inc.	402 P.2d 633 (1965)	50	d.p. was negligent

Table B-1

DESIGN PROFESSIONAL COST ESTIMATE ERROR AND COURT DECISION

No.	Title	Citation	% Error	Decision
37	Durand Associates, Inc. v. Guradian Investment	183 N.W.2d 246 (1971)	55	No recovery of fee
38	Spitz v. Brickhouse	123 N.E.2d (1954)	56	No recovery of fee
39	Arata v. Sunseri	147 So.2d 222 (1962)	56	d.p recoverd fee. owner actions (use of plans)
40	Keck v. Kavanaugh	177 N.W. 99 (1920)	61	No recovery of fee
41	Hirsch v. Kuhne	149 So.2d 630 (1963)	64	No recovery of fee
42	Moossy v. Huckabay Hospital, Inc.	283 So.2d 699 (1973)	74	d.p. recovered fee. no cost limit
43	Wick v. Murphy	54 N.W.2d 805 (1952)	76	No recovery of fee
44	Emerson v. Kneezell	62 S.W. 551 (1900)	78	No recovery of fee
45	Goldberg v. Underhill	213 P.2d 516 (1950)	83	Owner awarded damages
46	Clark v. Madeira	477 S.W.2d 817 (1972)	87	No recovery of fee
47	Wetzel v. Roberts	296 Mich. 114 (1941)	87	No recovery of fee
48	Torres v. Jarmon	501 S.W.2d 369 (1973)	90	No recovery of fee
49	Eberhard v. Mehlman	60 A.2d 540 (1948)	90	No recovery of fee
50	Campbell v. Evens and Howard Sewer Pipe Co.	286 S.W.2d 399	90	No recovery of fee
51	Stanley Consult., Inc. v. H. Kalicak Constr. Co.	383 F.Supp. 315 (1974)	100	No recovery of fee
52	Getzshman v. Miller Chemical, Inc.	443 N.W.2d 260 (1989)	100	d.p. recovered fee. owner actions and no cost limit
53	Peteet v. Fogarty	375 S.E.2d 527 (1988)	105	No recovery of fee
54	Pieri v. Rosebrook	275 P.2d 67 (1954)	107	d.p recovered fee. owners actions (acquiesced)

Table B-1
DESIGN PROFESSIONAL COST ESTIMATE ERROR AND COURT DECISION

No.	Title	Citation	% Error	Decision
55	Loewy v. A. Rosenthal, Inc.	104 F.Supp. 496 (1952)	118	d.p. recoverd fee. owners actions (ordered changes)
56	Parrish v. Tahtaras	318 P.2d 642 (1957)	123	d.p. recovered fee. owner actions (abandonment)
57	Headlund v. Daniels	167 P. 1170 (1917)	133	No recovery on % of actual cost. d.p. recovered fixed fee
58	Almand v. Alexander	23 S.W.2d 611(1930)	142	No recovery of additional fee
59	Kostorhyz v. Mcquire	212 N.W.2d 850 (1973)	180	No recovery of fee
60	Beacham v. Greenville County	62 S.E.2d 92 (1950)	216	No recovery of fee
61	Zannoth v. Booth Radio Stations, Inc.	52 N.W.2d 678 (1952)	216	No recovery of fee
62	Rowell v. Crow	209 P.2d 149 (1949)	239	No recovery of fee
63	Tsoi v. Ebenezer Baptist Church	153 So.2d 592 (1963)	258	No recovery of fee

Table B-2

DESIGN PROFESSIONAL COST ESTIMATE ERROR AND COURT DECISION (NO FAULT OF OWNER)

No.	Title	Citation	% Error	Decision
1	Farnet v. Minyard	383 So.2d 440 (1980)	0	d.p. recovered fee
2	Marquis v. Laureston	40 N.W. 73 (1888)	0	originally 60% error. d.p. revised drawings to 0% error. dp. recovered
3	Coombs v. Beede	36 A. 104 (1896)	1	d.p. recovered fee
4	Vaky v. Phelps	194 S.W. 601 (1917)	7	d.p recovered fee
5	Impastato v. Senner	190 So.2d 111(1966)	11	d.p. recovered fee
6	Torres v. Jarmon	501 S.W.2d 369 (1973)	13	No recovery of fee
7	Griswold and Rauma, Architects, Inc. v. Aesculapius Corp.	221 N.W.2d 556 (1974)	14	d.p. recovered fee
8	Kurz v. Quincy Post 37 American Legion	283 N.E.2d 8 (1972)	14	d.p. recovered fee
9	Bissell v. McCormack	162 Was. 482 (1931)	15	d.p recovered fee
10	Rock v. Enelow	292 So.2d 756 (1974)	15	d.p. recovered fee
11	Brooklyn Sav. and Loan Assoc. v. Tousley	16 Ohio C.C. N.S. (1907)	20	No recovery of fee
12	Wuellner v. Illinois Bell Tel. Co.	60 N.E.2d 867 (1945)	23	No recovery of fee above original fixed amount
13	Rosenthal v. Gauthier	69 So.2d 367 (1953)	24	No recovery of fee
14	Kunz v. Torbeck	31 Ohio L.R. 373 (1928)	25	No recovery of fee
15	Stevens v. Fanning	207 N.E.2d 136 (1965)	27	No recovery of fee
16	Bruno v. Williams	76 So.2d 41 (1954)	27	No recovery of fee
17	Caldwell v. United Presbyterian Church	180 N.E.2d 638 (1956)	28	No recovery of fee
18	Spurgeon v. Buchter	192 Cal.App.2d 198 (1961)	29	No recovery of fee
19	De Armond v. Tappan	85 Pa. Super. 236 (1925)	30	No recovery of fee
20	Capital Hotel Co. v. Rittenberry	41 S.W.2d 697 (1931)	33	No recovery of fee
21	Rose v. Shearer	431 S.W.2d 939 (1968)	35	No recovery of fee
22	MacDonnell v. Dreyfus	81 So. 383 (1919)	38	No recovery of fee

Table B-2

DESIGN PROFESSIONAL COST ESTIMATE ERROR AND COURT DECISION (NO FAULT OF OWNER)

No.	Title	Citation	% Error	Decision
23	Williar v. Nagle	71 A. 427 (1908)	39	No recovery of fee
24	Graham v. Bell-Irving	91 P. 8 (1907)	40	No recovery of fee
25	Reynolds v. Long	154 S.E.2d 299 (1967)	41	No recovery of fee
26	Andry and Feital v. Ewing	130 So. 570 (1930)	50	No recovery of fee
27	Malo v. Gilman	379 N.E.2d 554 (1978)	50	No recovery of fee
28	Kellogg v. Pizza Oven, Inc.	402 P.2d 633 (1965)	50	d.p. was negligent
29	Durand Associates, Inc. v. Guradian Investment	183 N.W.2d 246 (1971)	55	No recovery of fee
30	Spitz v. Brickhouse	123 N.E.2d (1954)	56	No recovery of fee
31	Keck v. Kavanaugh	177 N.W. 99 (1920)	61	No recovery of fee
32	Hirsch v. Kuhne	149 So.2d 630 (1963)	64	No recovery of fee
33	Wick v. Murphy	54 N.W.2d 805 (1952)	76	No recovery of fee
34	Emerson v. Kneezell	62 S.W. 551 (1900)	78	No recovery of fee
35	Goldberg v. Underhill	213 P.2d 516 (1950)	83	Owner awarded damages
36	Clark v. Madeira	477 S.W.2d 817 (1972)	87	No recovery of fee
37	Wetzel v. Roberts	296 Mich. 114 (1941)	87	No recovery of fee
38	Torres v. Jarmon	501 S.W.2d 369 (1973)	90	No recovery of fee
39	Eberhard v. Mehlman	60 A.2d 540 (1948)	90	No recovery of fee
40	Campbell v. Evens and Howard Sewer Pipe Co.	286 S.W.2d 399	90	No recovery of fee
41	Stanley Consult., Inc. v. H. Kalicak Constr. Co.	383 F.Supp. 315 (1974)	100	No recovery of fee
42	Peteet v. Fogarty	375 S.E.2d 527 (1988)	105	No recovery of fee
43	Headlund v. Daniels	167 P. 1170 (1917)	133	No recovery on % of actual cost. d.p. recovered fixed fee

Table B-2
DESIGN PROFESSIONAL COST ESTIMATE ERROR AND COURT DECISION (NO FAULT OF OWNER)

No.	Title	Citation	% Error	Decision
44	Almand v. Alexander	23 S.W.2d 611(1930)	142	No recovery of additional fee
45	Kostorhyz v. Mcquire	212 N.W.2d 850 (1973)	180	No recovery of fee
46	Beacham v. Greenville County	62 S.E.2d 92 (1950)	216	No recovery of fee
47	Zannoth v. Booth Radio Stations, Inc.	52 N.W.2d 678 (1952)	216	No recovery of fee
48	Rowell v. Crow	209 P.2d 149 (1949)	239	No recovery of fee
49	Tsoi v. Ebenezer Baptist Church	153 So.2d 592 (1963)	258	No recovery of fee

Table B-3

CASES DETERMINED BY READING THE CONTRACT AS A WHOLE

No.	Title	Citation	Percent Error	Decision	Read as a Whole		
					Cat I	Cat II	Cat III
1	Baylor University v. Guy A. Carlander	316 S.W.2d 277 (1958)		d.p recovered fee. No fixed limit			X
2	Beacham v. Greenville County	62 S.E.2d 92 (1950)	216	No recovery of fee		X	
3	Bruno v. Williams	76 So.2d 41 (1954)	27	No recovery of fee		X	
4	Clark v. Madeira	477 S.W.2d 817 (1972)	87	No recovery of fee	X		
5	Durand Associates, Inc. v. Guradian Investment	183 N.W.2d 246 (1971)	55	No recovery of fee	X		
6	Eberhard v. Mehlman	60 A.2d 540 (1948)	90	No recovery of fee		X	
7	Getzshman v. Miller Chemical, Inc.	443 N.W.2d 260 (1989)	100	d.p. recovered fee. Owner actions			X
8	Goldberg v. Underhill	213 P.2d 516 (1950)	83	Owner awarded damages		X	
9	Guirey, Srnka, and Arnold v. City of Phoenix	449 P.2d 306 (1969)		d.p. recovered fee. no cost limit			X
10	Jetty, Inc. v. Hall-McGuff Architects	595 S.W.2d 918 (1980)		d.p. recovered fee. no cost limit			X
11	Kahn v. Terry	628 So.2d 390 (1993)	37	d.p. recovered fee. no fixed limit			X
12	Kleinschmidt, Brassette, and Assoc. v. Ayres	368 So. 2d 1153 (1979)		d.p. recovered fee. no fixed limit			X
13	Kostorhyz v. Mcquire	212 N.W.2d 850 (1973)	180	No recovery of fee		X	
14	Kurz v. Quincy Post 37 American Legion	283 N.E.2d 8 (1972)	14	d.p. recovered fee. no fixed limit			X
15	Loyal Order of Moose v. Faulhaber	41 N.W.2d 535 (1950)		No recovery of fee.		X	
16	Moossy v. Huckabay Hospital, Inc.	283 So.2d 699 (1973)	74	d.p. recovered fee. owner actions and no fixed limit			X
17	Rose v. Shearer	431 S.W.2d 939 (1968)	35	No recovery of fee		X	

Table B-3

CASES DETERMINED BY READING THE CONTRACT AS A WHOLE

No.	Title	Citation	Percent Error	Decision	Read as a Whole		
					Cat I	Cat II	Cat III
18	Rosenthal v. Gauthier	69 So.2d 367 (1953)	24	No recovery of fee		X	
19	Rowell v. Crow	209 P.2d 149 (1949)	239	No recovery of fee		X	
20	Spitz v. Brickhouse	123 N.E.2d (1954)	56	No recovery of fee		X	
21	Spurgeon v. Buchter	192 Cal.App.2d 198 (1961)	29	No recovery of fee		X	
22	Stanley Consult., Inc. v. H. Kalicak Constr. Co.	383 F.Supp. 315 (1974)	100	No recovery of fee		X	
23	Stevens v. Fanning	207 N.E.2d 136 (1965)	27	No recovery of fee	X		
24	Torres v. Jarmon	501 S.W.2d 369 (1973)	13	No recovery of fee	X		
25	Tsoi v. Ebenezer Baptist Church	153 So.2d 592 (1963)	258	No recovery of fee		X	
26	Wetzel v. Roberts	296 Mich. 114 (1941)	87	No recovery of fee		X	
27	Wick v. Murphy	54 N.W.2d 805 (1952)	76	No recovery of fee		X	

Appendix C

LIABILITY OF A CONSTRUCTION MANAGER FOR COST ESTIMATES

LIABILITY OF A CONSTRUCTION MANAGER FOR COST ESTIMATES

The following is a review of AIA Document B801/CMa, Standard Form of Agreement Between Owner and Construction Manager, 1992 Edition.

A review of the relevant paragraphs of AIA B801/CMa identifies similar language regarding cost estimates as contained in AIA B141. The contract requires the Construction Manager to provide estimates based on "volume, area, or other conceptual estimating techniques." Like the design professional, the Construction Manager is required to provide the estimates for the architect's review and the owner's approval at various intervals. Furthermore, the Construction Manager is required to "advise the owner and architect if it appears that the Construction Cost may exceed the latest approved Project Budget and make recommendations for corrective action."

In summary, AIA Construction Manager document is similar to the AIA B141 document with regards to cost estimating requirements. Despite the similar contractual protection, the courts may still find construction managers responsible for cost overruns (Lee, 1993). Although no specific court cases involving construction managers were included in this research, the duties responsibilities, and potential liabilities appear to be the same as would be for a design professional.

Appendix D

GUIDE TO MINIMIZING LIABILITY FOR COST ESTIMATES

GUIDE TO MINIMIZING LIABILITY FOR COST ESTIMATES

1. Reduce all agreements to writing and use standard form contracts whenever possible. Use AIA Document B162 as a guide for preparation of the "Statement of Probable Construction Cost." (AIA B162, 1987).

2. The owner should understand that you are providing only an estimate of construction cost, not a guarantee nor a fixed limit. If the client wants more, discuss providing a detailed cost estimate as an optional additional service, or suggest that the client hire a cost consultant to give specific, detailed advice. If preparing preliminary estimates, advise the owner at the end of each phase of design of any adjustments to the preliminary estimate of construction cost. Even if there are no changes, confirm this in writing with the owner (Heuer, 1987).

3. Devote the same careful planning and time to the cost estimate that is given to design of a system. Assess estimating accuracy. If 20% or less of the project estimates are not exceeded, the assessment is "good". If these cost estimates were not exceeded by more than a few percentage points, the assessment is "very well". If the cost estimates were exceeded by more than 10% on over 20% of the projects, the assessment is "poor" (Design Professionals Insurance Company, 1988, p. 54).

4. Avoid common estimating errors such as time of construction (cost and schedule are linked), quantity takeoff errors, math errors, miscalculation of indirect cost (i.e. equipment selection), construction method, unit price errors, and site evaluation (ex. water table) (Paek, 1993, pp. 30-33).

5. If using an owner prepared contract, use AIA B141 and the list of exclusions in a professional liability insurance policy as a checklist. This can alert design professional to areas of uninsured risk (Kornblut, 1978, p 59).

The following additional recommendations are offered by the author:

6. Educate the owner on the accuracy of estimates and go over the contract. This will help to adjust the owner's expectations, eliminate the perception that a guaranteed maximum exists, and help the owner to understand the contract. Do not make promises or guarantees regarding the accuracy of estimates.

7. Identify your risks, and evaluate the in-house capabilities based on the project type and experience. If the project is beyond the expertise of the firm or is of an unfamiliar nature, hire a professional estimating consultant.

Appendix E

RELEVANT CASES

Table C
RELEVANT CASES

No.	Name	Citation
1	Ada Street M. E. Church v. Garnsey	66 Ill. 132 (1872)
2	Almand v. Alexander	23 S.W.2d 611(1930)
3	Andry and Feital v. Ewing	130 So. 570 (1930)
4	Arata v. Sunseri	147 So.2d 222 (1962)
5	Arnott, Inc. v. L and E, Inc.	539 P.2d 1333 (1975)
6	Bair v. School Dist. No. 141 Smith County	146 P. 347 (1915)
7	Ballinger v. Howell Mfg. Co.	180 A.2d 555 (1962)
8	Baylor University v. Guy A. Carlander	316 S.W.2d 277 (1958)
9	Beacham v. Greenville County	62 S.E.2d 92 (1950)
10	Bebb v. Jordan	189 P. 553 (1920)
11	Benenato v. McDougall	137 P. 8 (1913)
12	Bergholtz v. City of Oregon	240 P. 225 (1925)
13	Binghamton Masonic Temple v. Binghamton	623 N.Y.S.2d 357 (1995)
14	Bissell v. McCormack	162 Was. 482 (1931)
15	Blackall v. Duthie-Strachan	155 N.E. 604 (1927)
16	Bowell v. Draper	129 N.W. 54 (1910)
17	Krinckle v. England	78 A. 638 (1910)
18	Brooklyn Sav. and Loan Assoc. v. Tousley	16 Ohio C.C. N.S. (1907)
19	Brown v. Cox	459 S.W.2d 471 (1970)
20	Bruno v. Gauthier	70 So.2d 693 (1954)
21	Bruno v. Williams	76 So.2d 41 (1954)
22	Bueche v. Eickenroht	220 S.W.2d 911(1949)
23	Caldwell v. United Presbyterian Church	180 N.E.2d 638 (1956)
24	Campbell v. Evens and Howard Sewer Pipe Co.	286 S.W.2d 399 (1956)
25	Cann v. Church of the Redeemer	85 S.W. 994 (1905)
26	Capital Hotel Co. v. Rittenberry	41 S.W.2d 697 (1931)
27	Clark v. Madeira	477 S.W.2d 817 (1972)
28	Cobb v. Thomas	565 S.W.2d 281 (1978)
29	Combs v. McLynn	419 S.E.2d 903 (1992)
30	Comstock Ins. Co. v. Thomas A. Hanson Assoc.	550 A.2d 731 (1988)
31	Coombs v. Beede	36 A. 104 (1896)
32	De Armond v. Tappan	85 Pa. Super. 236 (1925)
33	De Hoff v. Scott	69 Pa. Super. 9 (1918)
34	Dick v. Julien	279 F. 993 (1922)
35	Dudley v. Strain	130 S.W. 778 (1910)
36	Durand Associates, Inc. v. Guradian Investment	183 N.W.2d 246 (1971)
37	Eberhard v. Mehlman	60 A.2d 540 (1948)
38	Edward Barron Estate Co. v. Woodruff	163 Cal. 561(1993)
39	Edward M. Cohen and Assoc. v. First National Bank	624 N.E.2d 805 (1993)
40	Edwards v. Hall	141 A. 638 (1928)
41	Emerson v. Kneezell	62 S.W. 551 (1900)
42	Farnet v. Minyard	383 So.2d 440 (1980)
43	Feltham v. Sharp	25 S.E. 619 (1896)
44	Firmin v. Garber	353 So.2d 975 (1977)

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46	George Wagschal Associates Inc. v. West	107 N.W.2d 874 (1961)
47	Getzshman v. Miller Chemical, Inc.	443 N.W.2d 260 (1989)
48	Gilliland v. Elmwood Props.	391 S.E.2d 577 (1990)
49	Goodrich v. Lash	146 A.2d 169 (1958)
50	Goldberg v. Underhill	213 P.2d 516 (1950)
51	Graham v. Bell-Irving	91 P. 8 (1907)
52	Grant v. Dupont	8 B.C. 223 (1901)
53	Griswold and Rauma, Architects, Inc. v. Aesculapius Corp.	221 N.W.2d 556 (1974)
54	Guirey, Srnka, and Arnold v. City of Phoenix	449 P.2d 306 (1969)
55	Haines v. Bechdott	231 Cal.App.2d 659 (1965)
56	Hall v. Parry	118 S.W. 561(1909)
57	Harrison v. McLaughlin Bros., Inc.	70 A. 424 (1908)
58	Headlund v. Daniels	167 P. 1170 (1917)
59	Hellmuth v. Benoist	129 S.W. 257 (1910)
60	Hirsch v. Kuhne	149 So.2d 630 (1963)
61	Hutchinson v. Conway	34 N.S. 554 (1901)
62	Impastato v. Senner	190 So.2d 111(1966)
63	Issenhuth v. Independent School District No. 22	222 N.W. 494 (1928)
64	Jay Dee Shoes v. Ostroff	59 A.2d 738 (1948)
65	Jetty, Inc. v. Hall-McGuff Architects	595 S.W.2d 918 (1980)
66	Kahn v. Terry	628 So.2d 390 (1993)
67	Kaufman v. Leard	248 N.E.2d 480 (1969)
68	Keck v. Kavanaugh	177 N.W. 99 (1920)
69	Kellogg v. Pizza Oven, Inc.	402 P.2d 633 (1965)
70	Kleinschmidt, Brassette, and Assoc. v. Ayres	368 So. 2d 1153 (1979)
71	Koerber v. Middlesex College	258 A.2d 572 (1969)
72	Kostorhyz v. Mcquire	212 N.W.2d 850 (1973)
73	Kunz v. Torbeck	31 Ohio L.R. 373 (1928)
74	Kurz v. Quincy Post 37 American Legion	283 N.E.2d 8 (1972)
75	Lane v. Inhabitants of Town of Harmony	90 A. 546 (1914)
76	Loewy v. A. Rosenthal, Inc.	104 F.Supp. 496 (1952)
77	Loyal Order of Moose v. Faulhaber	41 N.W. 2d 535 (1950)
78	MacDonnell v. Dreyfus	81 So. 383 (1919)
79	Malo v. Gilman	379 N.E.2d 554 (1978)
80	Marquis v. Laureston	40 N.W. 73 (1888)
81	Martin v. McMahan	271 P. 1114 (1928)
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86	Moore v. Bolton	480 S.W.2d 805 (1972)

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89	Nolan v. Great S. Wireband Co.	127 So. 98 (1930)
90	Pack v. Wines	141 P. 105 (1915)
91	Parrish v. Tahtaras	318 P.2d 642 (1957)
92	Peteet v. Fogarty	375 S.E.2d 527 (1988)
93	Pickard and Anderson v. Young Men's Christian Assn.	119 A.D.2d 976 (1986)
94	Pieri v. Rosebrook	275 P.2d 67 (1954)
95	Pipe Welding Supply Co. v. Haskell, Conner, and Frost	96 A.D.2d 29 (1983)
96	Reynolds v. Long	154 S.E.2d 299 (1967)
97	Ritter v. School District	140 A. 126 (1928)
98	Robb v. Sherrill-Russell Lumber Co.	241 S.W. 64 (1922)
99	Rock v. Enelow	292 So.2d 756 (1974)
100	Rose v. Shearer	431 S.W.2d 939 (1968)
101	Rosenthal v. Gauthier	69 So.2d 367 (1953)
102	Rowell v. Crow	209 P.2d 149 (1949)
103	Schwender v. Schraft	141 N.E. 511 (1923)
104	Smith v. Dickey	11 S.W. 1049 (1889)
105	Spitz v. Brickhouse	123 N.E.2d 117 (1954)
106	Spurgeon v. Buchter	192 Cal.App.2d 198 (1961)
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108	Stevens v. Fanning	207 N.E.2d 136 (1965)
109	Strouth v. Wilkinson	224 N.W.2d 511 (1974)
110	Svarz v. Dunlap	271 P. 893 (1928)
111	Texas Delta Upsilon Foundation v. Fehr	307 S.W.2d 124 (1957)
112	Torres v. Jarmon	501 S.W.2d 369 (1973)
113	Tsoi v. Ebenezer Baptist Church	153 So.2d 592 (1963)
114	Vaky v. Phelps	194 S.W. 601 (1917)
115	Walsh v. St. Louis Exposition and Music Hall Assoc.	14 S.W. 772 (1890)
116	Watson, Watson, and Rutland/Architects, Inc. v. Mongomery County Bd. Ed.	559 So.2d 168 (1990)
117	Wees v. Warren	72 Mo.App. 641 (1897)
118	Wetzel v. Roberts	296 Mich. 114 (1941)
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120	Wick v. Murphy	54 N.W.2d 805 (1952)
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124	Wuellner v. Illinois Bell Tel. Co.	60 N.E.2d 867 (1945)
125	Zannoth v. Booth Radio Stations, Inc.	52 N.W.2d 678 (1952)